Lenovo G480/G485/ G580/G585/G780

Hardware Maintenance Manual

Note:

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 119.

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Contents

About this manual

This manual contains service and reference information for the following Lenovo product:

Lenovo G480/G485/G580/G585/G780

Use this manual to troubleshoot problems.

The manual is divided into the following sections:

- The common sections provide general information, guidelines, and safety information required for servicing computers.
- The product-specific section includes service, reference, and product-specific parts information.

Important:

This manual is intended only for trained servicers who are familiar with Lenovo products. Use this manual to troubleshoot problems effectively.

Before servicing a Lenovo product, make sure to read all the information under "Safety information" on page 1 and "Important service information" on page 16.

Safety information

This chapter presents the following safety information that you need to get familiar with before you service a Lenovo computer:

General safety

Follow these rules below to ensure general safety:

- Observe a good housekeeping in the area where the machines are put during and after the maintenance.
- When lifting any heavy object:
  1. Make sure that you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift it.
  4. Lift it by standing or pushing up with your leg muscles; this action could avoid the strain from the muscles in your back. Do not attempt to lift any object that weighs more than 16 kg (35 lb) or that you think is too heavy for you.
- Do not perform any action that causes hazards to the customer, or that makes the machine unsafe.
- Before you start the machine, make sure that other service representatives and the customer are not in a hazardous position.
- Please remove covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your toolcase away from walk areas so that other people will not trip it over.
- Do not wear loose clothing that can be trapped in the moving parts of the machine. Make sure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with the nonconductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Attention: Metal objects are good electrical conductors.
- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that may be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.
- Fan louvers on the machine help to prevent the overheating of internal components. Do not obstruct fan louvers or cover them with labels or stickers.

Electrical safety

Observe the following rules when working on electrical equipments.

Important:
Use only approved tools and test equipments. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.
Many customers have rubber floor mats near their machines that contain small conductive fibers to decrease electrostatic discharges. Do not use such kind of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near the equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine, and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.
    Attention: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
    Attention: An electrical shock can occur only when there is a complete circuit. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; instructions for these precautions are in the safety sections of maintenance information. Be extremely careful when you measure the high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- Never assume that power has been disconnected from a circuit. First, check it to make sure that it has been powered off.

- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution: do not become a victim yourself.
  - Switch off the power.
  - Send the victim to get medical aid.

Safety inspection guide

The purpose of this inspection guide is to assist you in identifying potential unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service personnel from injury. This guide addresses only those items. You should use good judgment to identify potential safety hazards due to attachment of non-Lenovo features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:
- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock)
- Explosive hazards, such as a damaged CRT face or a bulging capacitor
- Mechanical hazards, such as loose or missing hardware

To determine whether there are any potential unsafe conditions, use the following checklist at the beginning of every service task. Begin the checks with the power off, and the power cord disconnected.

Checklist:
1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   b. The power cord should be the type specified in the parts list.
   c. Insulation must not be frayed or worn.
4. Check for cracked or bulging batteries.
5. Remove the cover.
6. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
7. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables.
9. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling devices that are sensitive to electrostatic discharge

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:
1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:
- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Notes:
The use of a grounding system to guard against ESD damage is desirable but not necessary.

- – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- – When working on a double-insulated or battery-operated system, use an ESD common ground or reference point. You can use coax or connector-outside shells on these systems.
- – Use the round ground prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices: multilingual translations

The safety notices in this section are provided in English, French, German, Hebrew, Italian, Japanese, and Spanish.

Safety notice 1

Before the computer is powered on after FRU replacement, make sure all screws, springs, and other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical shorts.

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder-splitter können Kurzschlüsse erzeugen.

לפני הפעלת המחשב לאחר החלפת FRU יש לוודא
שכל הברגים, הקפיצים, וחלקים קטנים אחרים נמצאים
במקומם ואינם חופשיים לזוז בתוך המחשב. כדי לוודא
זאת, יש לטלטל את המחשב ולהקשיב לגילוי קולות שקשוק.
חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.

Prima di accendere l'elaboratore dopo che é stata effettuata la sostituzione di una FRU, accertarsi che tutte le viti, le molle e tutte le altri parti di piccole dimensioni siano nella corretta posizione e non siano sparse all'interno dell'elaboratore. Verificare ciò scuotendo l'elaboratore e prestando attenzione ad eventuali rumori; eventuali parti o pezzetti metallici possono provocare cortocircuiti pericolosi.

FRU の交換後、コンピュータの電源を入れる前に、ねじ、バネ、その他の小さな部品がすべて正しい位置にあり、またコンピュータの内部で緩んでいないことを確認してください。
これを確認するには、コンピュータを振って、カチャカチャと音がしないか確かめます。金属部品や金属破片はショートの原因になることがあります。

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

Safety notice 2

⚠ DANGER

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble a standby battery, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts-oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

סוללות המתנה מסוימות מכילות כמות קטנה של ניקל וקדמיום. אין לפרק סוללת המתנה, לטעון אותה מחדש, להשליך אותה לאש או למים או לקצר אותה. יש לסלק את הסוללה כנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

予備バッテリーの中には少量のニッケルとカドミウムが含まれているものがあります。したがって、予備バッテリーの分解、再充電、火または水の中への投棄、またはショートさせることは決して行わないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety notice 3

⚠ DANGER

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l’exposez ni au feu ni à l’eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n’utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d’exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

מארז הסוללה מכיל כמות קטנה של ניקל וקדמיום. אין לפרק את מארז הסוללה, להשליך אותו לאש או למים או לקצר אותו. יש לסלק את מארז הסוללה הסוללה כנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימה בזמן החלפת מארז הסוללה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell’acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell’appropriato Catalogo parti. L’impiego di una batteria non adatta potrebbe determinare l’incendio o l’esplosione della batteria stessa.

バッテリー・パックには少量のニッケルが含まれています。バッテリー・パックを分解したり、火または水の中に投げ込んだり、ショートさせないでください。バッテリー・パックの廃棄にあたっては、地方自治体の条例または規則に従ってください。バッテリー・パックを交換するときは、適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety notice 4

⚠ **DANGER**

The lithium battery can cause a fire, an explosion, or a severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une temperature supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systembatterie ist eine Lithiumbatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

סוללת הליתיום עלולה לגרום לשריפה, להתפוצצות או
לכוויות קשות. אין לטעון אותה מחדש, לסלק את המחבר
המקוטב שלה, לפרק אותה או לחמם אותה לטמפרטורה
העולה על 100 מעלות צלזיוס. אין לשרוף את הסוללה ואין
לחשוף את תוכן התא למים. יש לסלק את הסוללה כנדרש
בתקנות ובחוקים המקומיים. יש להשתמש רק בסוללה
המופיעה ברשימת החלקים המתאימים. שימוש בסוללה
אחרת עלול לגרום לסכנת שריפה או התפוצצות.

La batteria di supporto e una batteria al litio e puo incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

リチウム・バッテリーは、火災、爆発、または重症のやけどを引き起こすことがあります。バックアップ・バッテリーの充電、その極性コネクターの取り外し、バッテリー本体の分解、
100 ℃ (212 ˚F) 以上への加熱、焼却、電池の中身を水に浸すことはしないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

Safety notice 5

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water at least for 15 minutes. Seek medical care if any symptoms caused by the fluid are present after washing.

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

אם מסך הגביש הנוזלי (LCD) נשבר והנוזל מתוך המסך בא במגע
עם עיניכם או ידיכם, שטפו את האזורים הנגועים מיד במים במשך
15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים הנובעים
מהמגע עם הנוזל נמשכים לאחר השטיפה.

Nel caso che caso l'LCD si dovesse rompere ed il liquido in esso contenuto entrasse in contatto con gli occhi o le mani, lavare immediatamente le parti interessate con acqua corrente per almeno 15 minuti; poi consultare un medico se i sintomi dovessero permanere.

LCD が破損し、 LCD の中の液体が目に入ったり、手に触れたりした場合は、液体が触れた部分を少なくとも 15 分間洗い流してください。洗い流した後に、液体によって何らかの症状が現れた場合は、医師の治療を受けてください。

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún

Safety notice 6

⚠ DANGER

To avoid shock, do not remove the plastic cover that protects the lower part of the inverter card.

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק
המגן על חלקו התחתון של הכרטיס ההפוך.

Per evitare scosse elettriche, non rimuovere la copertura in plastica che avvolge la parte inferiore della scheda invertitore.

感電を防ぐため、インバーター・カードの下部を保護しているプラスチック・カバーを外さないでください。

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

Safety notice 7

⚠ DANGER

Though the main batteries have low voltage, a shorted or grounded battery can produce enough current to burn personnel or combustible materials.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

אף שהסוללות הראשיות הן בעלות מתח נמוך, סוללה
מקוצרת או מוארקת עלולה להפיק זרם מספיק לגרימת
כוויות או להצתת חומרים דליקים.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

メイン・バッテリーの電圧は低くても、ショートしたり、接地したバッテリーが、作業者にやけどを負わせたり、可燃物を燃やすだけの電流を発生させる場合があります。

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

Safety notice 8

⚠ DANGER

Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d’alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d’interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

לפני סילוק FRU כלשהו, יש לכבות את המחשב, לנתק את כל כבלי החשמל משקעי החשמל, להוציא את מארז הסוללה, ואז לנתק כבלי חיבור אחרים אם יש כאלה.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

FRU を取り外す前に、 ThinkPad の電源を切って、すべての電源コードをコンセントから外してください。次に、バッテリー・パックを外し、相互接続ケーブルを外してください。

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

Laser compliance statement

Some models of Lenovo computer are equipped from the factory with an optical storage device such as a CD-ROM drive or a DVD-ROM drive. Such devices are also sold separately as options. If one of these drives is installed, it is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

If a CD-ROM drive, a DVD-ROM drive, or another laser device is installed, note the following:

⚠ **CAUTION**

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.

凡未在这里指明的任何控制用法、调整、行为，
都会导致严重后果。

Pour éviter tout risque d’exposition au rayon laser, respectez les consignes de réglage et d’utilisation des commandes, ainsi que les procédures décrites.

Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.

Az itt előírt eljárásoktól, beállításoktól és vezérlésektől
eltérni a lézersugárzás veszélye miatt kockázatos !

L’utilizzo di controlli, regolazioni o l’esecuzione di procedure diverse da quelle specificate possono provocare l’esposizione a.

Использование элементов настройки и
выполнение процедур иных, чем указано
здесь, может привести к опасному
радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných
výrobcov, ako je v tomto špecifikované, mohlo by mať
za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

本書で指定された内容以外の、お客様による整備、調整、または手順を行った場合、レーザー光の放射の危険があります。

El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.

Opening the CD-ROM drive, the DVD-ROM drive, or any other optical storage device could result in exposure to hazardous laser radiation. There are no serviceable parts inside those drives. **Do not open**.

A CD-ROM drive, a DVD-ROM drive, or any other storage device installed may contain an embedded Class 3A or Class 3B laser diode. Note the following:

⚠ **DANGER**

Emits visible and invisible laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看
视觉仪器，并且避免直接接触在激光光束之中。

Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.

Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.

Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést!

Aprendo l’unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l’esposizione diretta al fascio.

Открывая, берегитесь лазерного излучения.
Не смотрите на луч, не разглядывайте его
с помощью оптических инструментов, а также
избегайте прямого воздействия лазерного луча.

Keď je laserová jednotka otvorená. Vyhnite sa priamemu
pohľadu a nehľadte priamo s optickými nástrojmi do ľúča
a vyhnite sa priamemu vystaveniu ľúčov.

開けるとレーザー光が放射されます。光線を見つめたり、光学機械を使って直接見
たりしないでください。

Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.

Important service information

This chapter presents the following important service information:

- "Strategy for replacing FRUs" on page 16
  - "Strategy for replacing a hard disk drive" on page 17
  - "Important notice for replacing a system board" on page 17
- "Important information about replacing RoHS compliant FRUs" on page 18

Important:
BIOS and device driver fixes are customer-installable. The BIOS and device drivers are posted on the customer support site: http://consumersupport.lenovo.com/.

Strategy for replacing FRUs

Before replacing parts:

Make sure that all software fixes, drivers, and BIOS downloads are installed before replacing any FRUs listed in this manual.

After a system board is replaced, ensure that the latest BIOS is loaded to the system board before completing the service action.

To download software fixes, drivers, and BIOS, follow the steps below:

1. Go to http://consumersupport.lenovo.com/.
2. Enter the serial number or select a product or use Lenovo smart downloading.
3. Select the BIOS/Driver/Applications and download.
4. Follow the directions on the screen and install the necessary software.

Use the following strategy to prevent unnecessary expense for replacing and servicing FRUs:

- If you are instructed to replace an FRU, but the replacement does not solve the problem, reinstall the original FRU before you continue.
- Some computers have both a processor board and a system board. If you are instructed to replace either of them, and replacing one of them does not solve the problem, reinstall that board, and then replace the other one.
- If an adapter or a device consists of more than one FRU, any of the FRUs may be the cause of the error. Before replacing the adapter or device, remove the FRUs one by one to see if the symptoms change. Replace only the FRU that changed the symptoms.

Attention: The setup configuration on the computer you are servicing may have been customized. Running Automatic Configuration may alter the settings. Note the current configuration settings (using the View Configuration option); then, when service has been completed, verify that those settings remain in effect.

Strategy for replacing a hard disk drive

Always try to run a low-level format before replacing a hard disk drive. This will cause all customer data on the hard disk to be lost. Make sure that the customer has a current backup of the data before performing this action.

Attention: The drive startup sequence in the computer you are servicing may have been changed. Be extremely careful during write operations such as copying, saving, or formatting. If you select an incorrect drive, data or programs can be overwritten.

Important notice for replacing a system board

Some components mounted on a system board are very sensitive. Improper handling can cause damage to those components, and may cause a system malfunction.

Attention: When handling a system board:

- Do not drop the system board or apply any excessive force to it.
- Avoid rough handling of any kind.
- Avoid bending the system board and hard pushing to prevent cracking at each BGA (Ball Grid Array) chipset.

Important information about replacing RoHS compliant FRUs

RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC) is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the original FRU parts are non-compliant, replacement parts can also be non-compliant. In all cases if the original FRU parts are RoHS compliant, the replacement part must also be RoHS compliant.

Note: RoHS and non-RoHS FRU part numbers with the same fit and function are identified with unique FRU part numbers.

Lenovo plans to transit to RoHS compliance well before the implementation date and expects its suppliers to be ready to support Lenovo's requirements and schedule in the EU. Products sold in 2005 and 2006 will contain some RoHS compliant FRUs. The following statement pertains to these products and any product Lenovo produces containing RoHS compliant FRUs.

RoHS compliant FRUs have unique FRU part numbers. Before or after the RoHS implementation date, failed RoHS compliant parts must always be replaced with RoHS compliant ones, so only the FRUs identified as compliant in the system HMM or direct substitutions for those FRUs may be used.

<table>
<tr><th colspan="2">Products marketed before June 2006</th><th colspan="2">Products marketed after June 2006</th></tr>
<tr><th>Current or original part</th><th>Replacement FRU</th><th>Current or original part</th><th>Replacement FRU</th></tr>
<tr><td>Non-RoHS</td><td>Can be Non-RoHS</td><td rowspan="4">Must be RoHS</td><td rowspan="4">Must be RoHS</td></tr>
<tr><td>Non-RoHS</td><td>Can be RoHS</td></tr>
<tr><td>Non-RoHS</td><td>Can sub to RoHS</td></tr>
<tr><td>RoHS</td><td>Must be RoHS</td></tr>
</table>

Note: A direct substitution is a part with a different FRU part number that is automatically shipped by the distribution center at the time of the order.

General checkout

This chapter presents the following information:

- "What to do first" on page 20
- "Power system checkout" on page 21

Before you go to the checkout, make sure to read the following important notes:

Important notes:

- **Only certified trained personnel can service the computer.**
- **Before replacing any FRU, read the entire page on removing and replacing FRUs.**
- **When you replace FRUs, use new nylon-coated screws.**
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace an FRU only with another FRU of the correct model.** When you replace an FRU, make sure that the machine model and the FRU part number are correct by referring to the FRU parts list.
- **An FRU should not be replaced just because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. Consider replacing an FRU only when a problem recurs. If you suspect that an FRU is defective, clear the error logs and run the test again. If the error does not recur, do not replace the FRU.
- **Be careful not to replace a nondefective FRU.**

What to do first

When you do return an FRU, you must include the following information in the parts exchange form or parts return form that you attach to it:

1. Name and phone number of servicer
2. Date of service
3. Date on which the machine failed
4. Date of purchase
5. Procedure index and page number in which the failing FRU was detected
6. Failing FRU name and part number
7. Machine type, model number, and serial number
8. Customer’s name and address

Note for warranty: During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer.

The following is a list of some common items that are not covered under warranty and some symptoms that might indicate that the system was subjected to stress beyond normal use.

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following list:

The following are not covered under warranty:

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic parts
- Plastic parts, latches, pins, or connectors that have been cracked or broken by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card or the installation of an incompatible card
- Improper disk insertion or use of an optical drive
- Diskette drive damage caused by pressure on the diskette drive cover, foreign material in the drive, or the insertion of a diskette with multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer unusable)
- Sticky keys caused by spilling a liquid onto the keyboard
- Use of an incorrect AC adapter on laptop products

The following symptoms might indicate damage caused by nonwarranted activities:

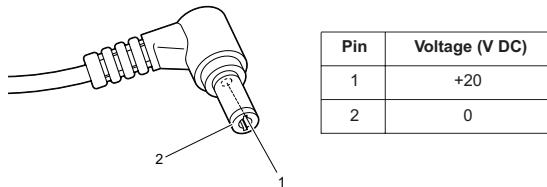
- Missing parts might be a symptom of unauthorized service or modification.
- If the spindle of a hard disk drive becomes noisy, it may have been subjected to excessive force, or dropped.

Power system checkout

To verify a symptom, follow the steps below:

1. Turn off the computer.
2. Remove the battery pack.
3. Connect the AC adapter.
4. Make sure that power is supplied when you turn on the computer.
5. Turn off the computer.
6. Disconnect the AC adapter and install the charged battery pack.
7. Make sure that the battery pack supplies power when you turn on the computer.

If you suspect a power problem, see the appropriate one of the following power supply checkouts:

- “Checking the AC adapter” on page 21
- “Checking operational charging” on page 22
- “Checking the battery pack” on page 22

Checking the AC adapter

You are here because the computer fails only when the AC adapter is used.

- If the power-on indicator does not turn on, check the power cord of the AC adapter for correct continuity and installation.
- If the computer does not charge during operation, go to “Checking operational charging”.

To check the AC adapter, follow the steps below:

1. Unplug the AC adapter cable from the computer.
2. Measure the output voltage at the plug of the AC adapter cable. See the following figure:

Pin	Voltage (V DC)
1	+20
2	0

Note: Output voltage for the AC adapter pin No. 2 may differ from the one you are servicing.

3. If the voltage is not correct, replace the AC adapter.
4. If the voltage is acceptable, do the following:

- Replace the system board.
- If the problem persists, go to “Lenovo G480/G485/G580/G585/G780” on page 27.

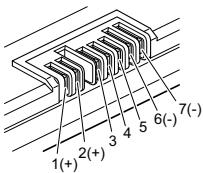
Note: Noise from the AC adapter does not always indicate a defect.

Checking operational charging

To check whether the battery charges properly during operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator or icon does not light on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator or icon is still off, replace the battery pack.

If the charge indicator still does not light on, replace the system board. Then reinstall the battery pack. If it is still not charged, go to the next section.

Checking the battery pack

Battery charging does not start until the Power Meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check your battery, move your cursor to the Power Meter icon in the icon tray of the Windows® taskbar and wait for a moment (but do not click it), and the percentage of battery power remaining is displayed. To get detailed information about the battery, double-click the Power Meter icon.

Note: If the battery pack becomes hot, it may not be able to be charged. Remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall and recharge it.

To check the battery pack, follow the steps below:

1. Turn off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 7 (-). See the following figure:

Terminal	Voltage (V DC)
1	+0 to +12.6
7	Ground (-)

3. If battery output voltage is less than +3.9V DC, the battery is damaged, replace it.
   If battery output voltage is less than +9V DC, perhaps the battery has entered into overdischarge protection mode, pre-charge the battery with AC, please replace the battery if battery capacity can not be charged over 0% within 2 hours.
4. If the battery output voltage is more than +9V DC, measure the resistance between battery terminals 5 and 7. The resistance should be 4 to 30 KΩ.
   If the resistance is not correct, replace the battery pack. If the resistance is correct, check the system board function.

Related service information

This chapter presents the following information:

Restoring the factory contents by using Recovery Disc Set

When the hard disk drive or solid state drive is replaced because of a failure, no product recovery program is on the new drive. In this case, you must use the *Recovery Disc Set* for the computer. Order the *Recovery Disc Set* and the drive at the same time so that you can recover the new drive with the pre-installed software when they arrive.

The *Recovery Disc Set* consists of the following set of DVDs to restore the computer to the original factory configuration.

Start Recovery Disc (one disc)

This disc is used to format the hard disk drive and initiate the recovery process.

Operating System Recovery Disc (one or more discs)

This disc restores the Microsoft Windows operating system.

Applications and Drivers Recovery Disc (one or more discs)

This disc restores the pre-installed applications and drivers on the computer.

Supplemental Recovery Disc

This disc contains additional content, such as software for specific models and updates to the software that was preloaded on the computer. Not all recovery disc sets come with a *Supplemental Recovery Disc*.

To restore the computer to the original factory configuration using the recovery disc set, do the following:

1. Insert the bootable *Start Recovery Disc* into the optical drive.
2. Start the computer. When the Lenovo logo comes up, immediately press F12; on the boot sequence menu, select the optical drive as the first boot-up device. The computer will boot from the *Start Recovery Disc*. Follow the on-screen instructions to begin the recovery process.
3. Read the license. If you agree with the terms, select **I accept these terms and conditions** and then click **Next**.
4. Insert the **Operating System Recovery Disc** when prompted and click **Yes** to begin the operating system recovery process.
5. Insert the *Applications and Drivers Recovery Disc* when prompted and then click **OK** to begin the applications and drivers recovery process.
6. If you have a *Supplemental Recovery Disc*, insert it when prompted and click **Yes**. If you do not have a *Supplemental Recovery Disc*, click **No**.

7. When all of the data has been copied from the last disc in the set, remove the disc and restart the computer.

Note: The remainder of the recovery process is fully automated and no action is required by you. The computer will restart into the Windows desktop several times and you might experience periods when no activity is apparent on the screen for several minutes at a time. This is normal.

8. When the recovery process is complete, the Welcome to the Microsoft Windows screen is displayed. Follow the instructions on the screen to complete the Windows setup.

Passwords

As many as three passwords may be needed for any Lenovo computer: the power-on password (POP), the hard disk password (HDP), and the supervisor password (SVP).

If any of these passwords has been set, a prompt for it appears on the screen whenever the computer is turned on. The computer does not start until the password is entered.

Exception: If only an SVP is installed, the password prompt does not appear when the operating system is booted.

Power-on password

A power-on password (POP) protects the system from being powered on by an unauthorized person. The password must be entered before an operating system can be booted.

Hard-disk password

There are two hard-disk passwords (HDPs):

+ User HDP - for the user

+ Master HDP - for the system administrator, who can use it to get access to the hard disk drive even if the user has changed the user HDP

Attention: If the user HDP has been forgotten, check whether a master HDP has been set. If it has, it can be used for access to the hard disk drive. If no master HDP is available, neither Lenovo nor Lenov authorized service technicians provide any services to reset either the user or the master HDP, or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

Supervisor password

A supervisor password (SVP) protects the system information stored in the BIOS Setup Utility. The user must enter the SVP in order to get access to the BIOS Setup Utility and change the system configuration.

Attention: If the SVP has been forgotten and cannot be made available to the servicer, there is no service procedure to reset the password. The system board must be replaced for a scheduled fee.

Power management

Note: Power management modes are not supported for APM operating system.

To reduce power consumption, the computer has three power management modes: screen blank, sleep (standby), and hibernation.

Screen blank mode

If the time set on the “Turn off monitor” timer in the operating system expires, the LCD backlight turns off. You can also turn off the LCD backlight by pressing Fn+F2.

To end screen blank mode and resume normal operation, press any key.

Sleep (standby) mode

When the computer enters sleep (standby) mode, the following events occur in addition to what occurs in screen blank mode:

- The LCD is powered off.
- The hard disk drive is powered off.
- The CPU stops.

To enter sleep (standby) mode, press Fn+F1.

In certain circumstances, the computer goes into sleep (standby) mode automatically:

- If a “suspend time” has been set on the timer, and the user does not do any operation with the keyboard, the hard disk, the parallel connector, or the diskette drive within that time.
- If the battery indicator is amber, indicating that the battery power is low. (Alternatively, if **Hibernate when battery becomes low** has been selected in the “Power Management Properties” window, the computer goes into hibernation mode.)

To cause the computer to return from sleep (standby) mode and resume the operation, do one of the following:

- Press the Fn key.
- Open the lid.
- Turn on the power switch.

Also, in the following event, the computer automatically returns from sleep (standby) mode and resumes the operation:

- The time set on the resume timer elapses.

Note: The computer does not accept any input immediately after it enters sleep (standby) mode. Wait a few seconds before taking any action to reenter operation mode.

Hibernation mode

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

To cause the computer to enter hibernation mode, follow the steps below:

- If you are using the ACPI operating system and have defined one of the following actions as the event that causes the system to go into hibernation mode, perform that action:
  - Closing the lid.
  - Pressing the power button.

Also, the computer goes into hibernation mode automatically in either of the following conditions:

- If a “hibernation time” has been set on the timer, and if the user does not do any operation with the keyboard, the hard disk drive, the parallel connector, or the diskette drive within that time.
- If the timer conditions are satisfied in suspend mode.

When the power is turned on, the computer returns from hibernation mode and resumes operation. The hibernation file in the boot record on the hard disk drive is read, and system status is restored from the hard disk drive.

Lenovo G480/G485/G580/G585/G780

This chapter presents the following product-specific service references and product-specific parts information:

Specifications

The following table lists the specifications of the Lenovo G480/G485/G580/G585/G780:

Table 1. Specifications

Feature	Description
Processor	• Intel Chief River/Intel Huron River/AMD Deccan
Core Chipset	• Intel HM76 (HM75 ready)(G480/G580/G780)
Bus architecture	• G480/G485/G580/G585: DDR3 1600/1333 MHz (Ivy Bridge), 1333 MHz (Sandy Bridge) PCI Express bus DMI • G780: 5GT/s DMI 2.7GT/s FDI 1600MT/s DDR3 DRAM (PC3-12800) PCI Express Bus SATA Bus USB3.0 Bus USB2.0 Bus
Graphic Chipset	• Nvidia N13P-GL (G480/G580) • AMD Seymour XT (29x29, 64bit)(TBD)(G485/G585) • Intel HD Graphics 3000 (G780)
Display	• 14.0 HD LED Panel, Flat type, 1366x768 pixels, 200 nit (G480/G485) • 15.6 HD LED Panel, Flat type, 1366x768 pixels, 200 nit (G580/G585) • 17.3" HD+ LED Panel, 16:9, 1600x900 pixels, 220nits; Design ready for FHD (G780)
Standard memory	• DDR3-1333 or DDR3-1600 (× 1 or × 2)
CMOS RAM	• 256 bytes

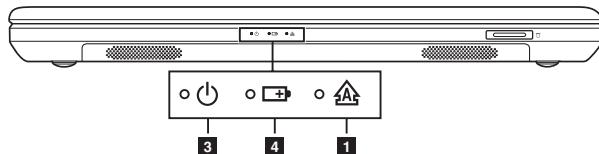



Table 1. Specifications (continued)

Feature	Description
Hard disk drive	• 2.5" , 9.5 mm / 7.0 mm Height SATA 320G /500 GB / 750 GB / 1 TB (5400 rpm) • 2.5" , 9.5 mm / 7.0 mm Height SATA 320G /500 GB (7200 rpm)
Optical drive	• Rambo/Blu-ray combo/Blu-ray Rambo
I/O port	• External monitor connector • Stereo headphone jack • Microphone jack • RJ45 × 1 • HDMI port • USB 3.0 × 2, USB 2.0 × 2 or USB 3.0 × 2, USB 2.0 × 1 (G480/G580) • 2-in-1 memory card reader(SD/MMC)
MODEM slot	• N/A
Audio	• 1/8" Stereo Headphone Output Jack (G780) • 1/8" Microphone Input Jack (G780) • Combo audio jack × 1 (G480/G485/G580/G585) • Built-in stereo speakers • Built-in microphone
Video	• CRT port x 1, HDMI port x 1
Ethernet (on the system board)	• 10/100 M or 10/100/1000 M Ethernet
PCI Express Mini Card slot	• 1 slot for WLAN card (half size)
Bluetooth wireless	• option
Keyboard	• 6 Row, Lenovo Keyboard
Touch pad	• Two clicks with Dome
Integrated camera	• 640 × 480 pixels or 1280 × 720 pixels
Battery	• 4400 mAh, 6 cell cylindrical Li-ion Battery
AC adapter	• 40 W or 65 W or 90 W
Pre-installed operating system	• Win 7 Starter/Home Basic/Home Premium/ Professional • Linpus lite/DOS • Win 8 (launch at 2nd half year of 2012)

Status indicators

The system status indicators below show the computer status:

Lenovo G480/G485/G580/G585

Lenovo G780

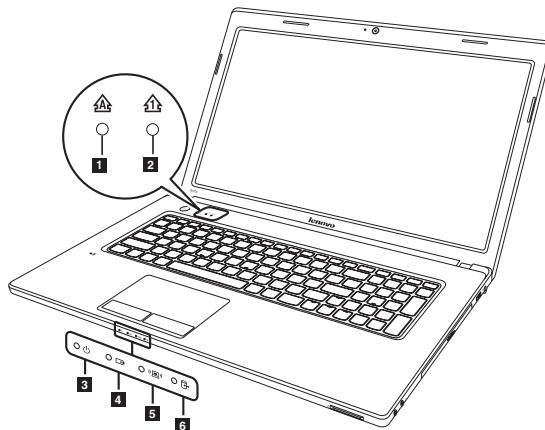



Table 2. Status indicators

Indicator	Meaning
1 Caps lock	**White:** Caps Lock mode is enabled. You can enter all alphabetic characters (A-Z) in uppercase without pressing the Shift key. To enable or disable Caps Lock mode, press the CapsLk key.
2 Num lock	**White:** The separate numeric keypad on the keyboard is enabled. To enable or disable the numeric keypad, press the Num Lock key.
3 Power on	**White:** System is enabled. **Blinking white:** System is in sleep mode. **off:** System is in hibernate mode or shut down.

4 Battery status	**Blinking amber:** (500ms off/1s on) The remaining power of the battery is less than 5% of its capacity. **Blinking amber:** (100ms off/3.2s on) The battery is being charged with the remaining power between 5% and 20% of its capacity. **Amber:** The computer is operating on battery power with the remaining power between 5% and 20% of its capacity. **Blinking white:** The battery is being charged with the remaining power between 20% and 80% of its capacity. **White:** The remaining power of the battery is more than 80% of its capacity, or the computer is operating on battery power with the remaining power between 20% and 80% of its capacity.
5 Wireless status	**White:** The wireless LAN radio is turned on and connected to AP. **Blinking white:** The wireless LAN is switched on and the radio of it is also turned off, or the wireless LAN radio is turned on and not connected to AP. **Flashing white:** The wireless LAN radio is turned on and data is being transmitted. **off:** The wireless LAN is switched off and the radio of it is also turned off.
6 Drive in use	**White:** Data is being read from or written to the hard disk drive, or the optical disk drive. When this indicator is on, do not put the computer into standby mode or turn off the computer. **Note:**Do not move the system while the white drive-in-use light is on. Sudden physical shock could cause drive errors.

Fn key combinations

The following table shows the function of each combination of Fn with a function key.

Table 3. Fn key combinations

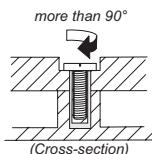
Key combination	Description
Fn + Esc:	Turn on/off the integrated camera.
Fn + F1:	Enter sleep mode.
Fn + F2:	Turn on/off the backlight of the LCD screen.
Fn + F3:	Open the interface for the display device switch to select this notebook or an external display.
Fn + F4:	Open the interface for display resolution settings.
Fn + F5:	Open the interface for integrated wireless devices settings (On/Off).
Fn + F6:	Enable/Disable the touchpad.
Fn + F8 (G480/G485):	Enable/Disable the numeric keypad.
Fn + F9:	Start/Pause playback of Windows Media Player.
Fn + F10:	Stop playback of Windows Media Player.
Fn + F11:	Skip to the previous track.
Fn + F12:	Skip to the next track.
Fn + Insert (G580/G585/G780): Fn + PgUp (G480/G485):	Enable/Disable the scroll lock.
Fn + PrtSc:	Activate the system request.
Fn + Home:	Activate the pause function.
Fn + End:	Activate the break function.
Fn + PgDn (G480/G485):	Activate the insert function.
Fn + ↑/↓:	Increase/Decrease display brightness.
Fn + →/←:	Increase/Decrease sound volume.

FRU replacement notices

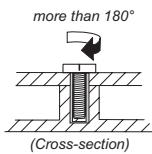
This section presents notices related to removing and replacing parts. Read this section carefully before replacing any FRU.

Screw notices

Loose screws can cause a reliability problem. In the Lenovo computer, this problem is addressed with special nylon-coated screws that have the following characteristics:

- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They are harder to tighten.
- Each one should be used only once.

Do the following when you service this machine:

- Keep the screw kit in your tool bag.
- Always use new screws.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

- **Plastic to plastic**
  Turn an additional 90° after the screw head touches the surface of the plastic part:

- **Logic card to plastic**
  Turn an additional 180° after the screw head touches the surface of the logic card:

- **Torque driver**
  If you have a torque screwdriver , refer to the "Torque" column for each step.
- Make sure that you use the correct screws. If you have a torque screwdriver, tighten all screws firmly to the torque shown in the table. **Never use a screw that you removed. Use a new one. Make sure that all screws are tightened firmly**.
- Ensure torque screwdrivers are calibrated correctly following country specifications.

Removing and replacing an FRU

This section presents exploded figures with the instructions to indicate how to remove and replace the FRU. Make sure to observe the following general rules:

1. Do not attempt to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. Before replacing any FRU, review “FRU replacement notices” on page 32.
3. Begin by removing any FRUs that have to be removed before the failing FRU. Any of such FRUs are listed at the top of the page. Remove them in the order in which they are listed.
4. Follow the correct sequence in the steps to remove the FRU, as given in the figures by the numbers in square callouts.
5. When turning a screw to replace an FRU, turn it in the direction as given by the arrow in the figure.
6. When removing the FRU, move it in the direction as given by the arrow in the figure.
7. To put the new FRU in place, reverse the removal procedures and follow any of the notes that pertain to replacement. For information about connecting and arranging internal cables, see “Locations” on page 92.
8. When replacing an FRU, use the correct screw as shown in the procedures.

⚠ **DANGER**

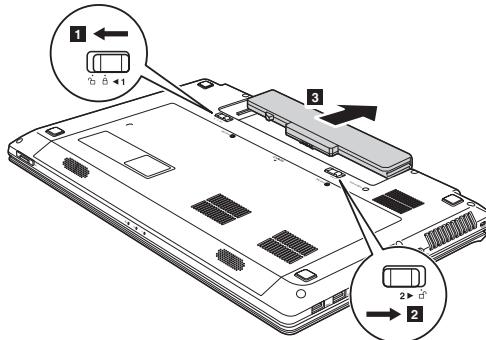
Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any of the interconnecting cables.

Attention: After replacing an FRU, do not turn on the computer until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the computer. Verify this by shaking the computer gently and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Attention: The system board is sensitive to, and can be damaged by, electrostatic discharge. Before touching it, establish personal grounding by touching a ground point with one hand or using an electrostatic discharge (ESD) strap (P/N 6405959) to remove potential shock reasons.

Note:

- The illustrations used in this section are of the Lenovo G580, unless otherwise stated.
- The procedures listed below (for removing components) are the same for the Lenovo G480/G485/G580/G585/G780.
- The illustrations in this manual may differ from the actual product. Please refer to the actual product.

1010 Battery pack

> ⚠ **DANGER**
> Only use the battery specified in the parts list for your computer. Any other battery could ignite or explode.

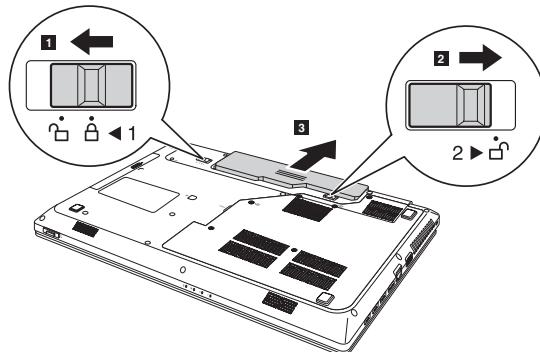
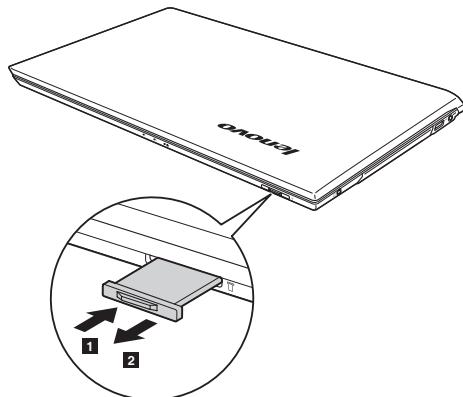



Figure 1. Removal steps of battery pack

Unlock the manual battery latch **1**. Holding the spring-loaded battery latch in the unlocked position **2**, remove the battery pack in the direction shown by the arrow **3**.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Install the battery pack along the slide rails of the slot. Then make sure that the battery release lever is in the locked position.

1020 Dummy card

For access, remove this FRU:

- "1010 Battery pack" on page 34

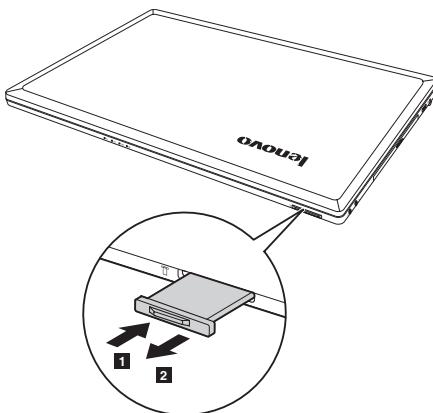



Figure 2. Removal steps of dummy card

Remove the dummy card in the direction shown by arrows 1 2.

Lenovo G480/G485/G580/G585

Lenovo G780

1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover

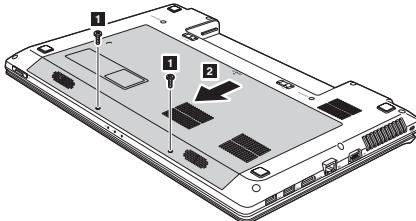
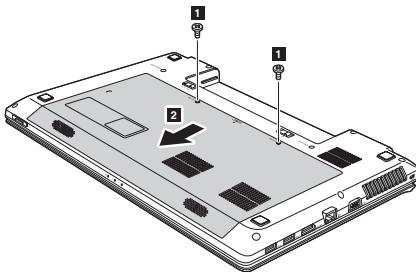
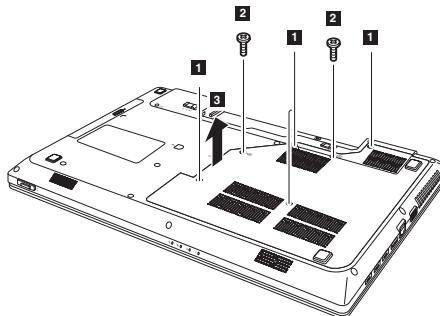
For access, remove this FRU:

- "1010 Battery pack" on page 34

Figure 3. Removal steps of Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover

Lenovo G480/G485/G580/G585

Remove the two screws **1**, then remove the compartment cover in the direction shown by the arrow **2**.

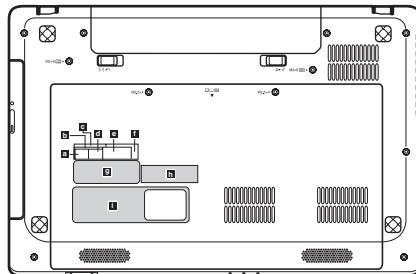
Lenovo G480:

Lenovo G580:

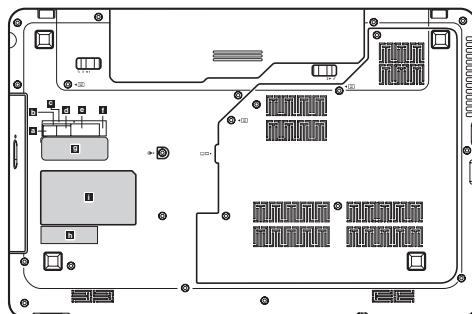
Lenovo G780:

Loosen the four screws 1 and remove the two screws 2 , then remove the compartment cover in the direction shown by the arrow 3.

Step	Screw (quantity)	Color	Torque
1	G480: M2.5×8.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm
	G580: M2.5×4.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm
2	M2.5×8.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm

Note: Applying labels to the base cover

The new base cover FRU is shipped with a kit containing labels of several kinds. When you replace the base cover, you need to apply the following label:

The following labels need to be peeled off from the old base cover, and need to be put on the new base cover.

a SIRIM BT Label
b BT Label forUS/CA/TW/INDONESIA
c BT Label for Brazil
d SIRIM WL Label
e W/L Label for US/CA/TW/INDONESIA
f W/L Label for Brazil/Israel
g COA Label
h PRC/MTM code Label
i Rating Label

For some models, you also need to apply one or two FCC labels. Check the old base cover; if it has one or two FCC labels, find duplicates of them in the label kit and apply them to the new base cover.

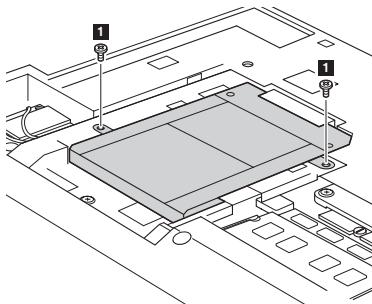
For the location of each label, refer to the following figure:

Lenovo G480/G485/G580/G585

Lenovo G780

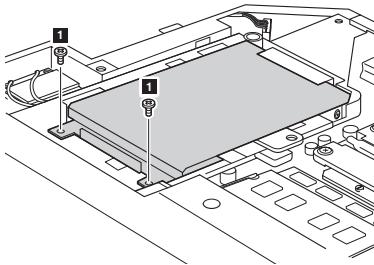
1040 Hard disk drive

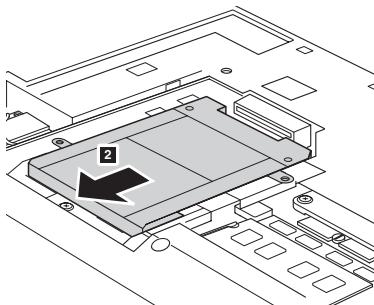
For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36

Attention:

- **Do not drop the hard disk drive or apply any physical shock to it.** The hard disk drive is sensitive to physical shock. Improper handling can cause damages and permanent loss of data.
- Before removing the drive, suggest the customer to backup all the information on it if possible.
- Never remove the drive while the system is operating or is in suspend mode.

Figure 4. Removal steps of hard disk drive

Remove the two screws 1.

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
1	M2.5×4.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm

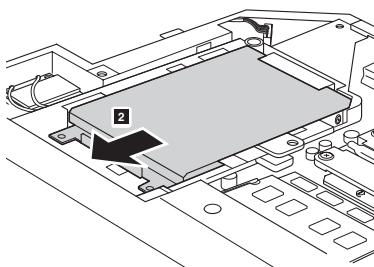
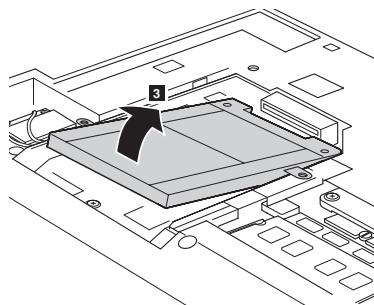
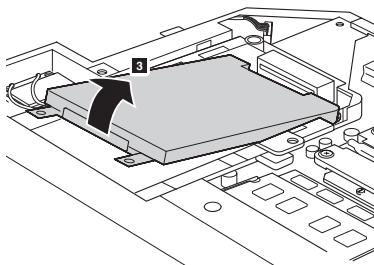



Figure 4. Removal steps of hard disk drive (continued)

Then pull the hard disk drive bracket in the direction shown by arrow **2**.

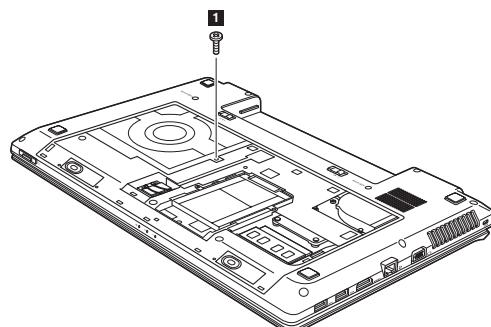
Lenovo G480/G485/G580/G585

Lenovo G780

Remove the hard disk drive (secured in the metal frame) in the direction shown by arrow **3**.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Make sure that the hard disk drive connector is attached firmly.

1050 Optical drive

For access, remove this FRU:

- "1010 Battery pack" on page 34
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36

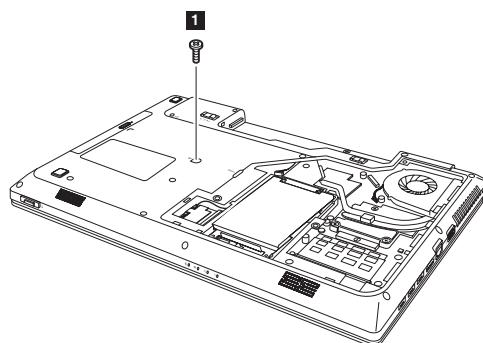
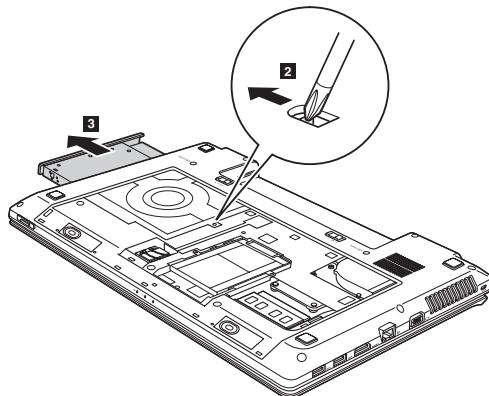
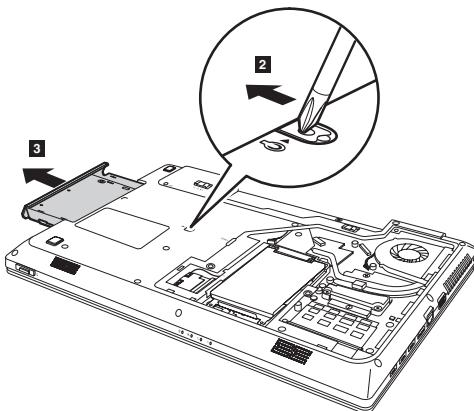



Figure 5. Removal steps of optical drive

Remove the screw **1**.

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
1	G480/G485/G580/G585: M2.5×6.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm
	G780: M2.5×8.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm

Insert a screwdriver into the screw hole and push the optical drive in the direction shown by arrow **2**. Pull the optical drive out in the direction shown by arrow **3**.

Lenovo G480/G485/G580/G585

Lenovo G780

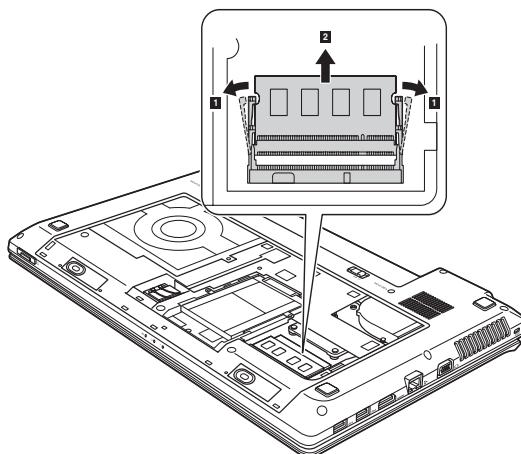
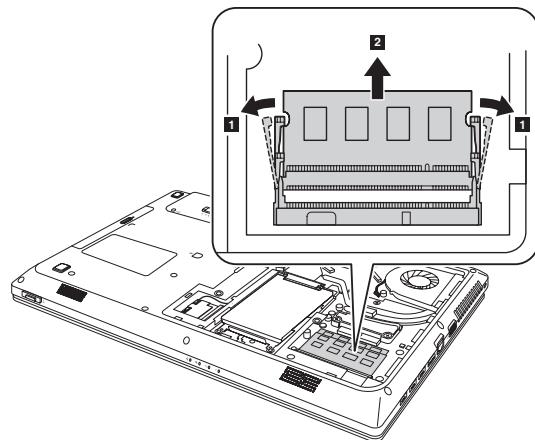
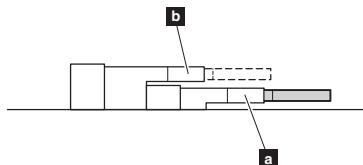
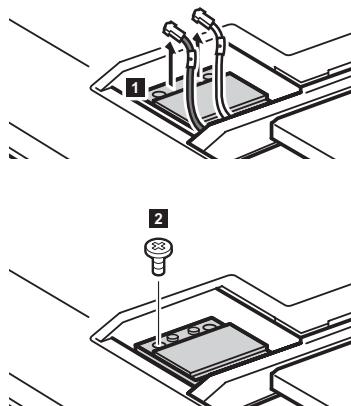
1060 DIMM

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36

Figure 6. Removal steps of DIMM

Release the two latches on both edges of the socket at the same time in the direction shown by arrows **1**, and then unplug the DIMM in the direction shown by arrow **2**.

Lenovo G480/G485/G580/G585

Lenovo G780

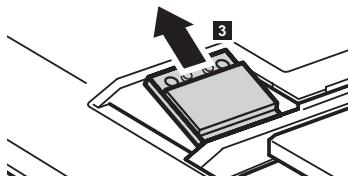
Note: If only one DIMM is used on the computer you are servicing, the card must be installed in SLOT-0 (a : lower slot), but not in SLOT-1 (b : upper slot).

When installing: Insert the notched end of the DIMM into the socket. Push the DIMM firmly, and pivot it until it snaps into the place. Make sure that it is firmly fixed in the slot and difficult to be moved.

1070 PCI Express Mini Card for wireless LAN/WAN

For access, remove these FRUs in order:

- "1010 Battery pack" on page 34
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36

Figure 7. Removal steps of PCI Express Mini Card for wireless LAN/WAN

Disconnect the two wireless LAN cables (black, white) **1**, and then remove the screw **2**.

In step **1**, unplug the jacks by using the removal tool antenna RF connector (P/N: 08K7159), or pick up the connectors with your fingers and gently unplug them in the direction shown by arrows.

Notes: wireless LAN card has 2 cables in step **1**.
wireless LAN card in some models may have 3 cables in step **1**.

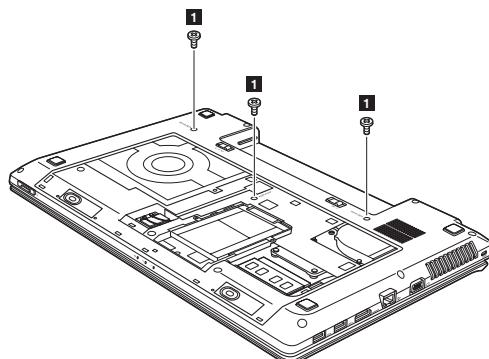
Step	Screw (quantity)	Color	Torque
2	M2.0×3.0 mm, flat-head, nylok-coated (1)	Black	1.5-2.0 kgfcm

Figure 7. Removal steps of PCI Express Mini Card for wireless LAN/WAN (continued)

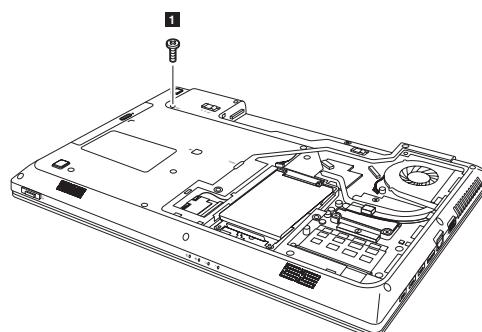
Remove the card in the direction shown by arrow **3**.

When installing:

- In models with a wireless LAN card that has two antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **1**, and the white cable (2nd) (AUX) into jack labeled **2** on the card.
- In models with a wireless LAN card that has three antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **1**, the grey cable (3rd) into jack labeled **3**, and the white cable (2nd) (AUX) into jack labeled **2** on the card.

1080 Keyboard

For access, remove this FRU:

- "1010 Battery pack" on page 34
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36

Figure 8. Removal steps of keyboard

Lenovo G480/G485/G580/G585

Remove the three screws **1**.

Lenovo G780

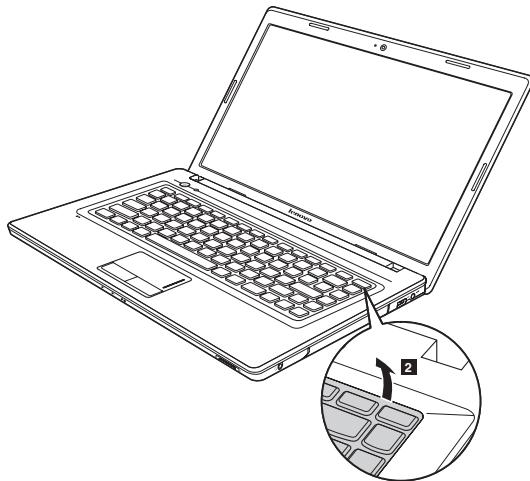
Remove one screw **1**.

Step	Screw (quantity)	Color	Torque
1	G480/G485/G580/G585: M2.0×6.0 mm, flat-head, nylok-coated (3) G780: M2.5×8.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm

Figure 8. Removal steps of keyboard (continued)

Loosen the keyboard with fingers in the direction shown by arrow **2**.

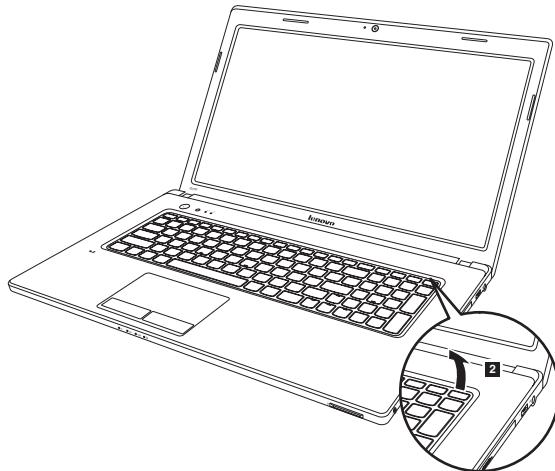
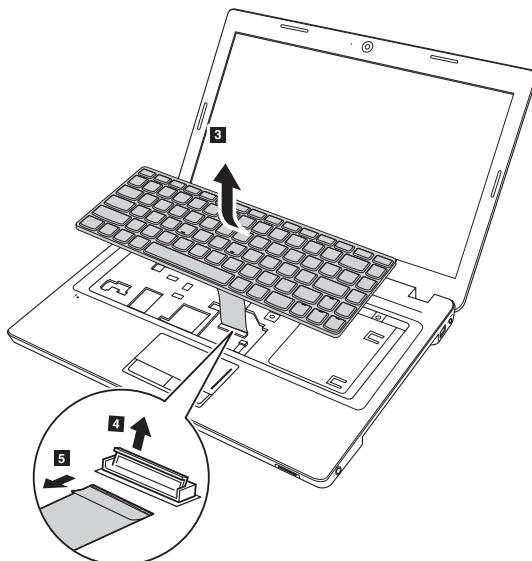
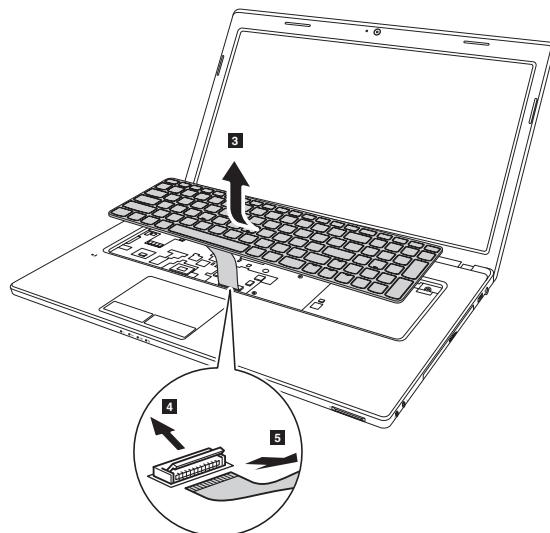
Lenovo G480/G485/G580/G585

Lenovo G780

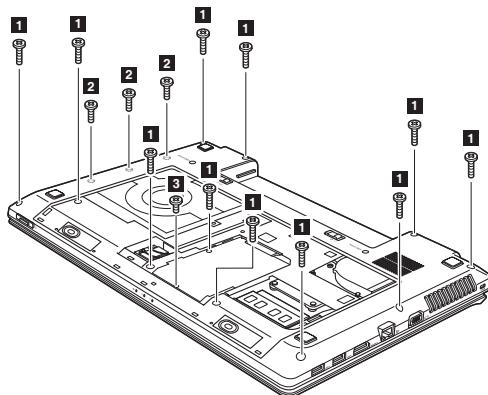
Figure 8. Removal steps of keyboard (continued)

Lift the keyboard a little 3, and then detach the connector in the direction shown by arrows 4 5.

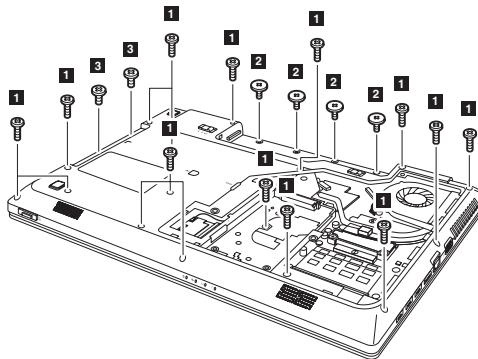
Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Make sure that the FPC connector is attached firmly.

1090 Keyboard bezel

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1080 Keyboard” on page 49

Figure 9. Removal steps of keyboard bezel

Lenovo G480/G485/G580/G585

Remove the eleven screws **1**, the three screws **2** and the one screw **3** on the bottom.

Lenovo G780

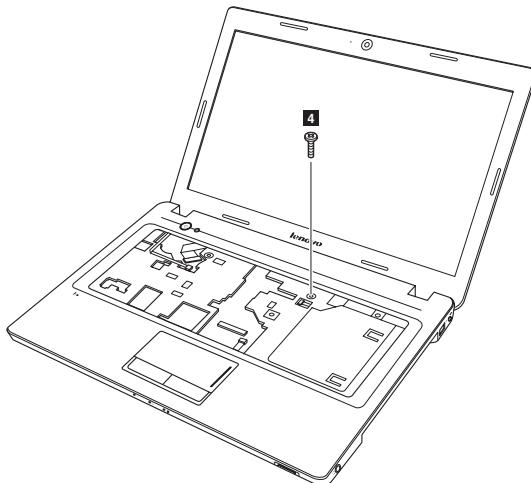
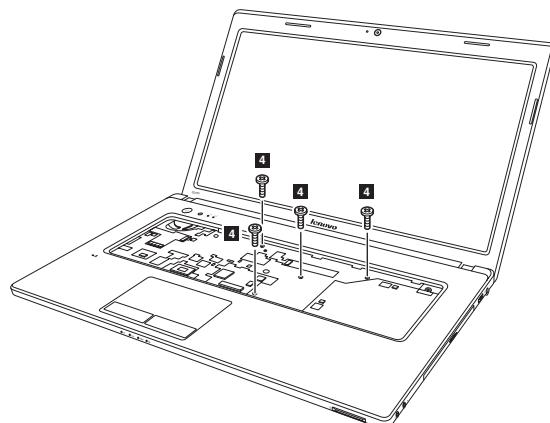
Remove the sixteen screws 1, the four screws 2 and the two screws 3 on the bottom.

Step	Screw (quantity)	Color	Torque
1	G480/G485/G580/G585: M2.5×6.0 mm, flat-head, nylok-coated (11) G780: M2.5×8.0 mm, flat-head, nylok-coated (16)	Black	2.0-2.5 kgfcm
2	G480/G485/G580/G585: M2.0×3.0 mm, flat-head, nylok-coated (3) G780: M2.0×2.0 mm, flat-head, nylok-coated (4)	Black	1.5-2.0 kgfcm
3	G480/G485/G580/G585: M2.5×4.0 mm, flat-head, nylok-coated (1) G780: M2.0×3.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm 1.5-2.0 kgfcm

Figure 9. Removal steps of keyboard bezel (continued)

Lenovo G480/G485/G580/G585

Remove the screw **4**.

Lenovo G780

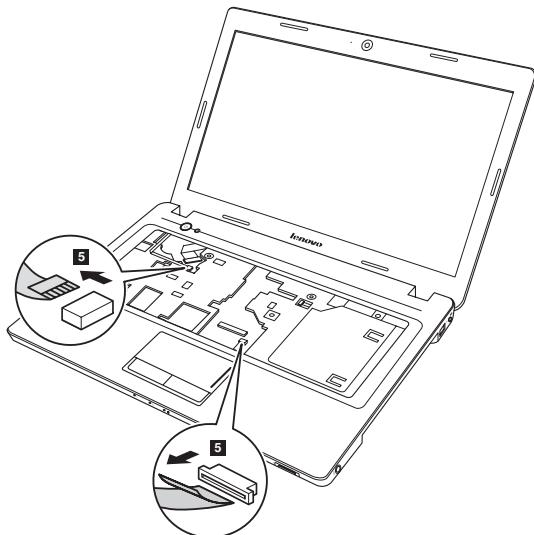
Remove the four screws **4**.

Step	Screw (quantity)	Color	Torque
4	G480/G485/G580/G585: M2.5×6.0 mm, flat-head, nylok-coated (1) G780: M2.5×5.0 mm, flat-head, nylok-coated (4)	Black	2.0-2.5 kgfcm

Figure 9. Removal steps of keyboard bezel (continued)

Detach the FPC connectors in the direction shown by arrows **5** .

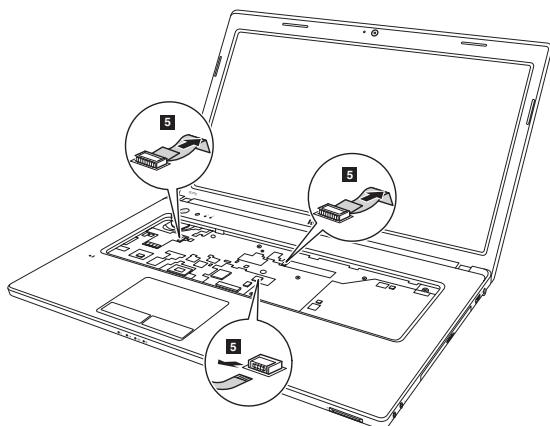
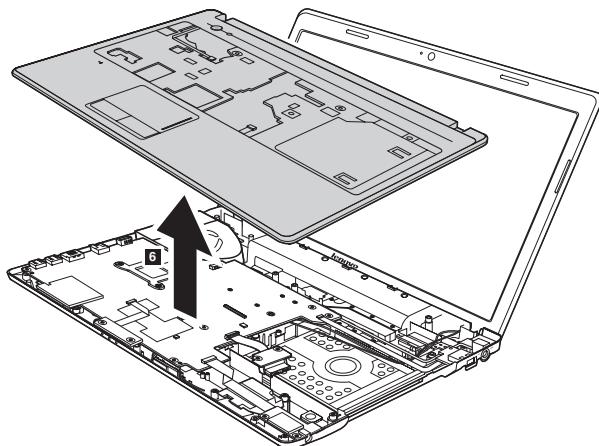
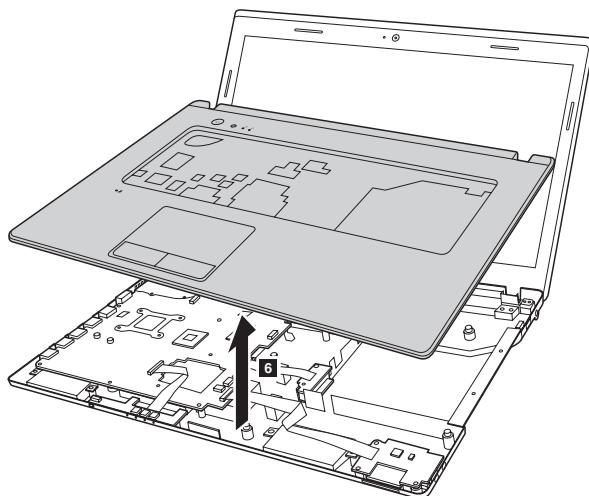
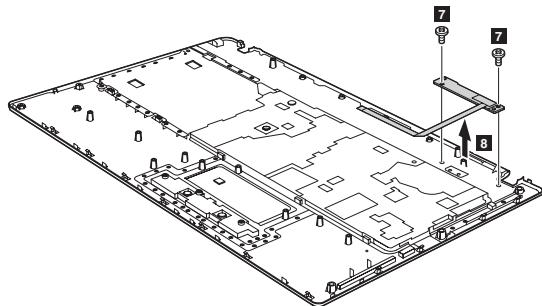
Lenovo G480/G485/G580/G585

Lenovo G780

Figure 9. Removal steps of keyboard bezel (continued)

Remove the keyboard bezel in the direction shown by arrow 6 .

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Make sure that all the FPC connectors, microphone connectors are attached firmly.

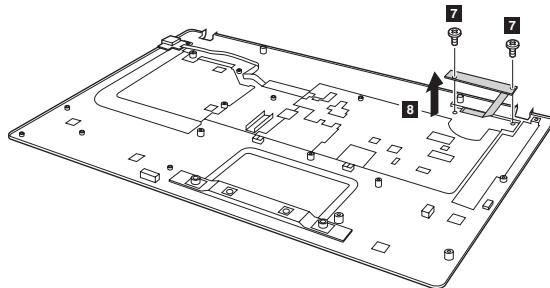
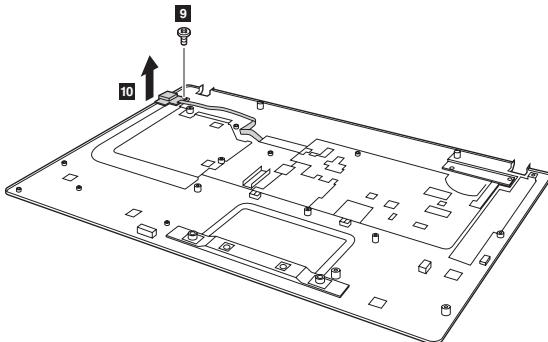



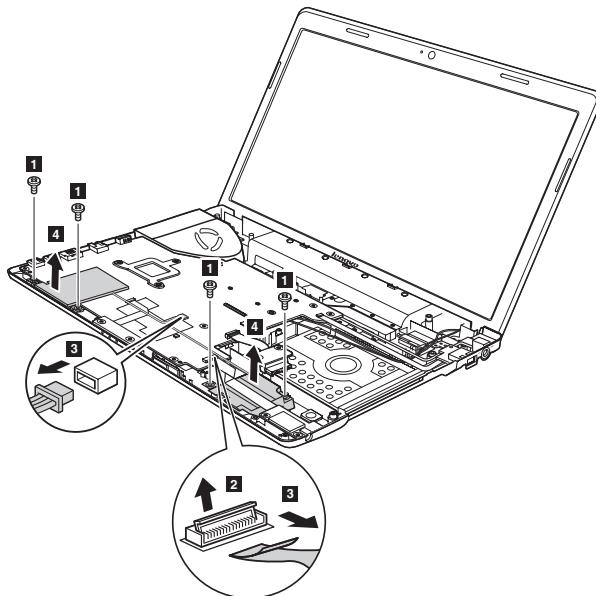
Figure 9. Removal steps of keyboard bezel (continued)

Remove the two screws 7, and then remove the power board in the direction shown by arrow 8.

Lenovo G480/G485/G580/G585

Lenovo G780

Lenovo G780

Remove the screw 9, and then remove the power board in the directioshown by arrow 10.

Step	Screw (quantity)	Color	Torque
7	M2.0×3.0 mm, flat-head, nylok-coated (2)	Black	1.5-2.0 kgfcm
9	G780: M2.0×3.0 mm, flat-head, nylok-coated (1)	Black	1.5-2.0 kgfcm

1100 Speakers (Lenovo G480/G485/G580/G585)

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52

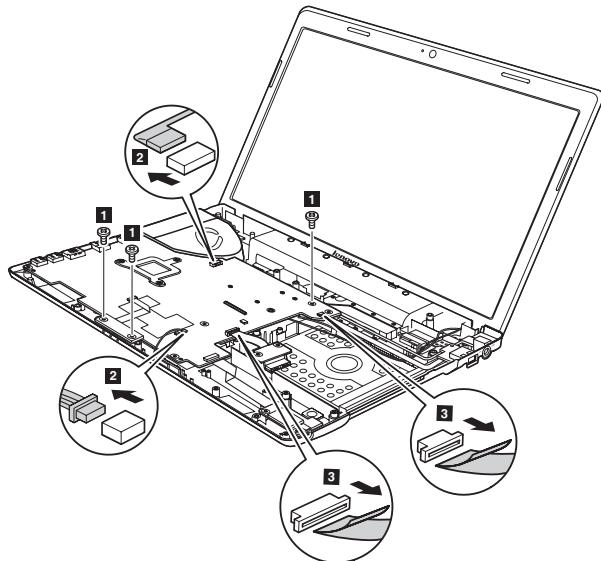
Figure 10. Removal steps of speakers (Lenovo G480/G485/G580/G585)

Remove the four screws **1**. Detach the speaker connector and FPC connector in the direction shown by arrows **2** **3**. Then remove the speakers by lifting in the direction shown by arrows **4**.

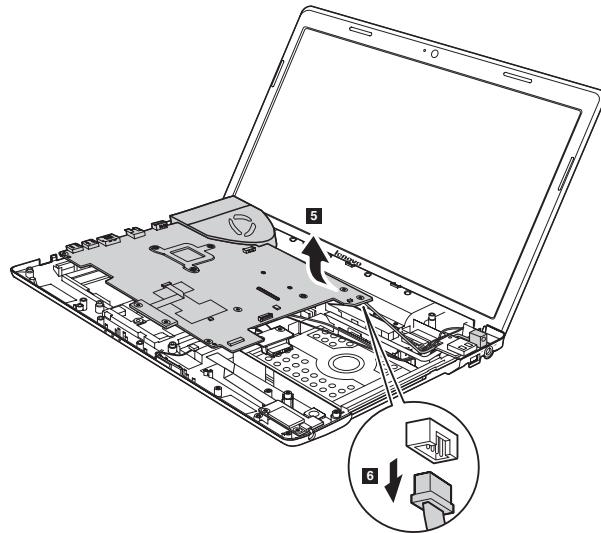
Step	Screw (quantity)	Color	Torque
1	M2.5×5.7+2 mm, flat-head, nylok-coated (4)	Black	2.0-2.5 kgfcm

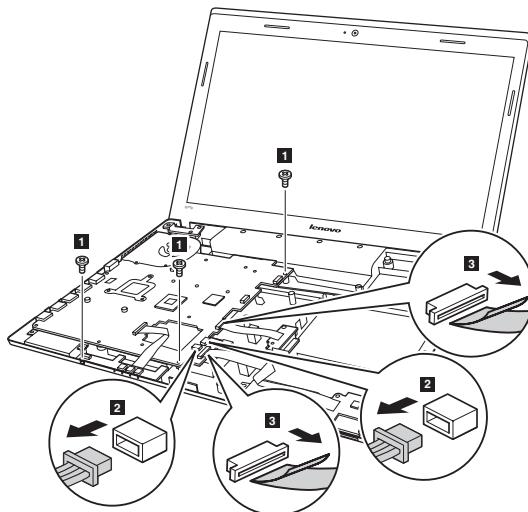
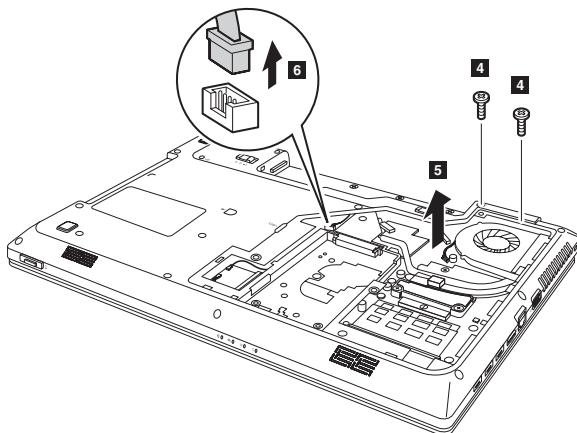
1110 System board

Important notices for handling the system board:
When handling the system board, bear the following in mind.

- Be careful not to drop the system board on a bench top that has a hard surface, such as metal, wood, or composite.
- Avoid rough handling of any kind.
- In the whole process, make sure not to drop or stack the system board.
- If you put a system board down, make sure to put it only on a padded surface such as an ESD mat or conductive corrugated material.

For access, remove these FRUs in order:

- "1010 Battery pack" on page 34
- "1020 Dummy card" on page 35
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36
- "1040 Hard disk drive" on page 39
- "1050 Optical drive" on page 43
- "1060 DIMM" on page 45
- "1070 PCI Express Mini Card for wireless LAN/WAN" on page 47
- "1080 Keyboard" on page 49
- "1090 Keyboard bezel" on page 52
- "1100 Speakers (Lenovo G480/G485/G580/G585)" on page 59

Figure 11. Removal steps of system board

Lenovo G480/G485/G580/G585

Remove the three screws 1. Unplug the LCD and Bluetooth connectors in the direction shown by arrows 2. Detach the two FPC connectors in the direction shown by arrows 3.

Lift the system board a little 4, and then detach the power connector in the direction shown by arrow 5.

Lenovo G780

Remove the three screws 1. Unplug the speakers and the bluetooth connectors in the direction shown by arrows 2. Detach the two FPC connectors in the direction shown by arrows 3.

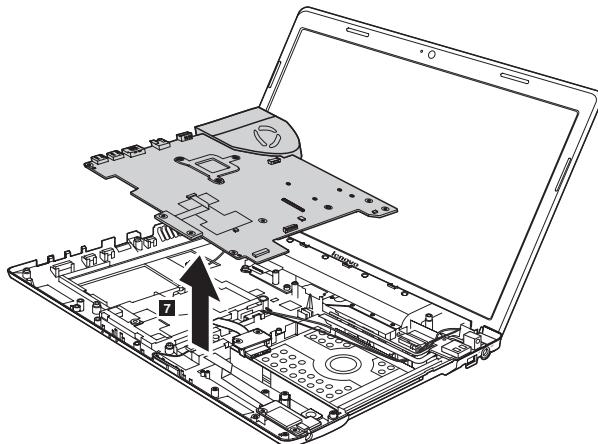
Remove two screws **4**. Unplug the LCD connector and power jack connector in the direction shown by arrows **5** **6**.

Step	Screw (quantity)	Color	Torque
1	M2.5×4.0 mm, flat-head, nylok-coated (3)	Black	2.0-2.5 kgfcm
4	G780: M2.5×4.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm

Figure 11. Removal steps of system board (continued)

Remove the system board in the direction shown by arrow **7**.

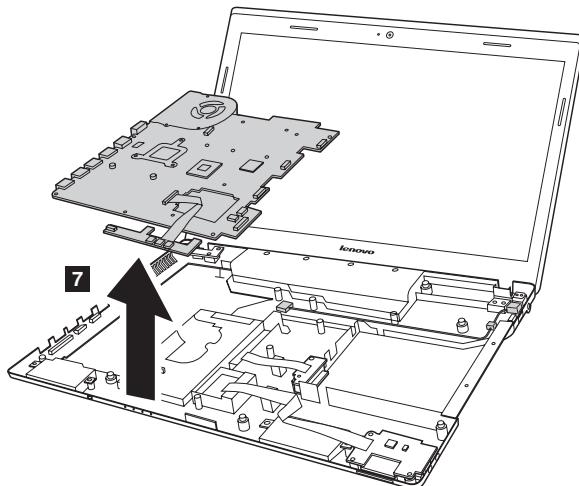
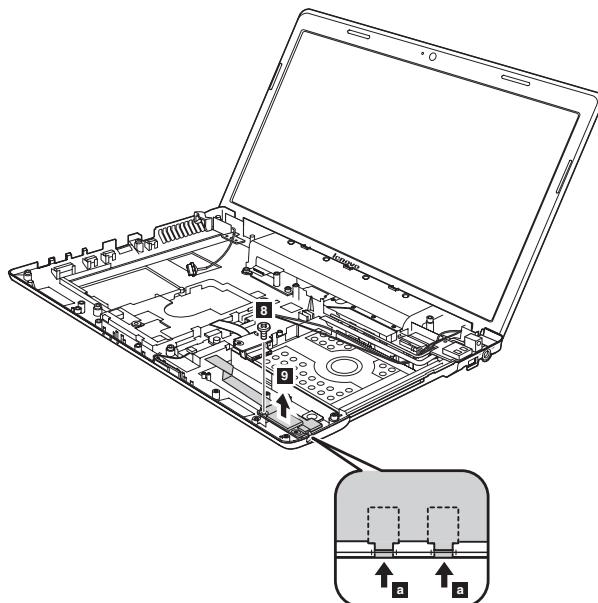
Lenovo G480/G485/G580/G585

Lenovo G780

Figure 11. Removal steps of system board (continued)

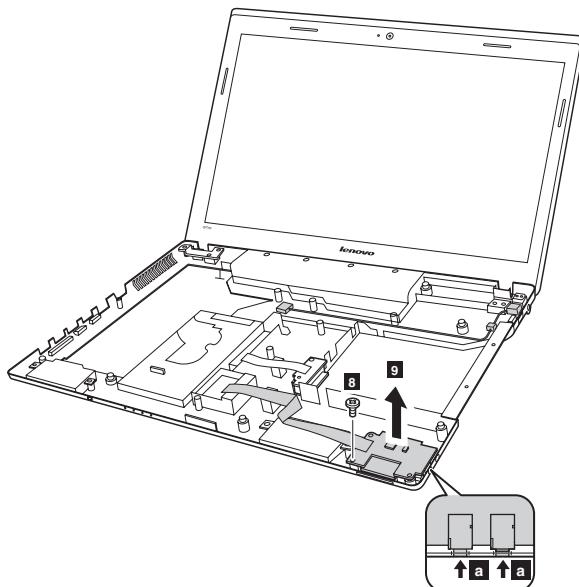
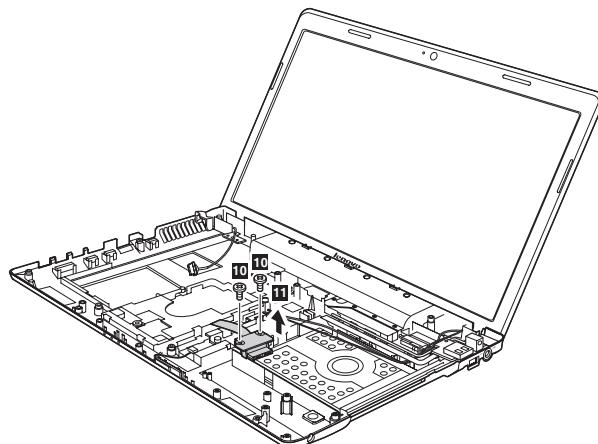
Remove the screw **8**. Then remove the card reader board in the direction shown by arrow **9**.

Lenovo G480/G485/G580/G585

Figure 11. Removal steps of system board (continued)

Lenovo G780

Step	Screw (quantity)	Color	Torque
8	M2.5×4.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm

When installing: When installing: When attaching the system board to the base cover, make sure that both of the audio jack and the microphone jack are attached to the holes on the base cover as shown in a. Improper placement of the switch or those jacks might cause a damage.

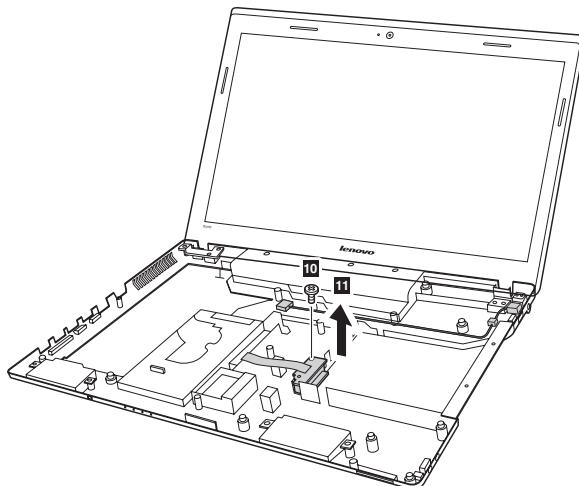
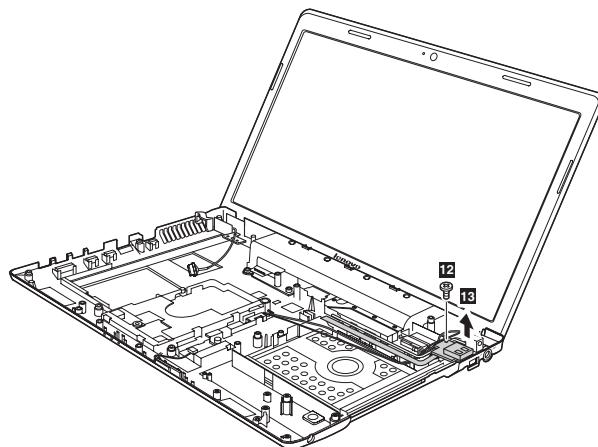



Figure 11. Removal steps of system board (continued)

Remove the screws **10**. Then remove the card reader board in the direction shown by arrow **11**.

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
10	G480/G485/G580/G585: M2.5×4.0 mm, flat-head, nylok-coated (2) G780: M2.5×4.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm

Figure 11. Removal steps of system board (continued)

Lenovo G480/G485/G580/G585

Remove the screw 12. Then remove the USB board in the direction shown by arrow 13.

Step	Screw (quantity)	Color	Torque
12	G480/G485/G580/G585: M2.5×4.0 mm, flat-head, nylok-coated (1)	Black	2.0-2.5 kgfcm

Remove the power jack in the direction shown by arrow 14.

Lenovo G480/G485/G580/G585

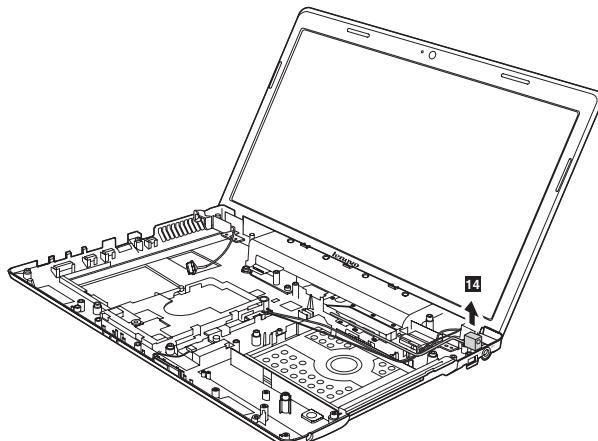
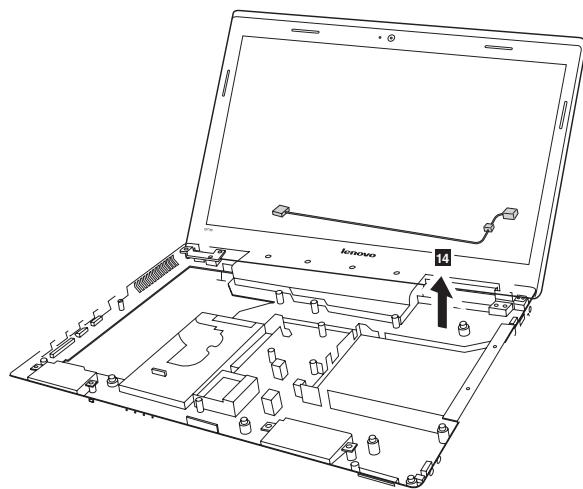



Figure 11. Removal steps of system board (continued)

Lenovo G780

When installing: Make sure that all the connectors are attached firmly.

1120 LCD unit

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60

Figure 12. Removal steps of LCD unit

Pull out the two antenna cables from the guide hole in the direction shown by arrows 1 and release them from their guides in the direction shown by arrows 2. Remove the four screws 3.

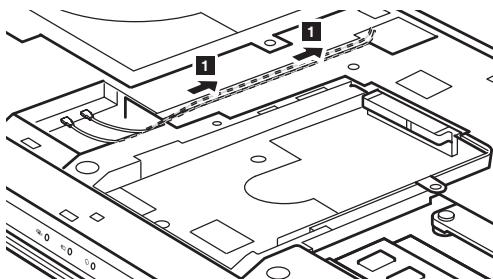
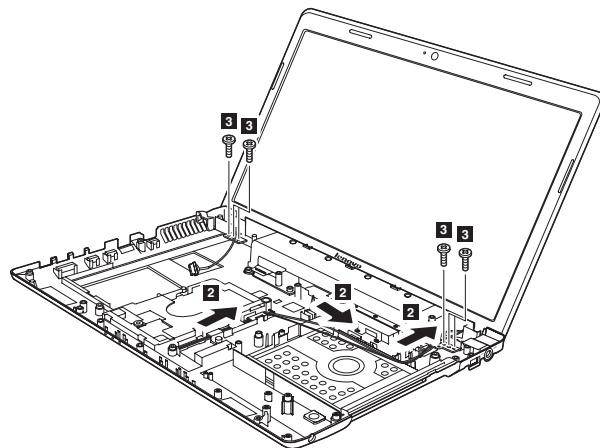
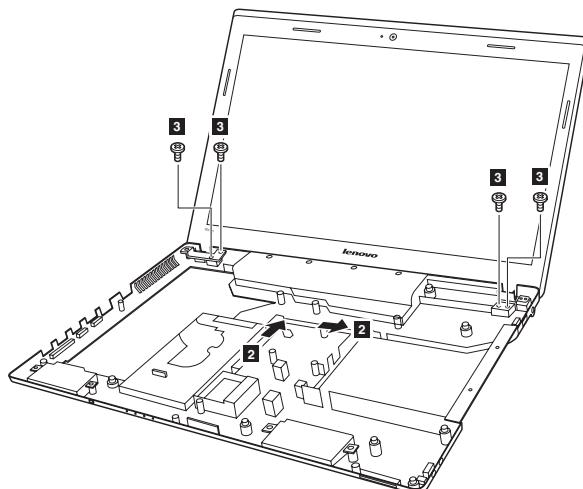



Figure 12. Removal steps of LCD unit (continued)

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
3	G480/G485/G580/G585: M2.5×6.0 mm, flat-head, nylok-coated (4)	Black	2.5-3.0 kgfcm
	G780: M2.5×5.0 mm, flat-head, nylok-coated (4)	white	2.0-2.5 kgfcm

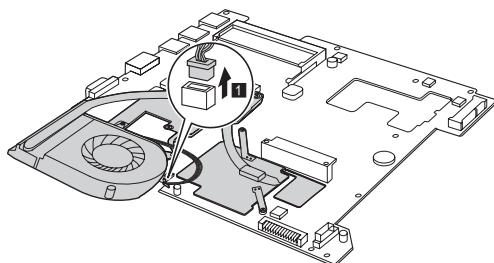
When installing:

- Route the antenna cables along the cable guides. As you route the cables, make sure that they are not subjected to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.
- Make sure that the LCD connector is attached firmly and make sure that you do not pinch the antenna cables when you attach the LCD assembly. Route the LCD cable along the cable guides.

Remove the LCD unit in the direction shown by arrows **4**.

Lenovo G480/G485/G580/G585

Lenovo G780

1130 Fan assembly and Heat Sink assembly

For access, remove these FRUs in order:

- "1010 Battery pack" on page 34
- "1020 Dummy card" on page 35
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36
- "1040 Hard disk drive" on page 39
- "1050 Optical drive" on page 43
- "1060 DIMM" on page 45
- "1070 PCI Express Mini Card for wireless LAN/WAN" on page 47
- "1080 Keyboard" on page 49
- "1090 Keyboard bezel" on page 52
- "1100 Speakers (Lenovo G480/G485/G580/G585)" on page 59
- "1110 System board" on page 60

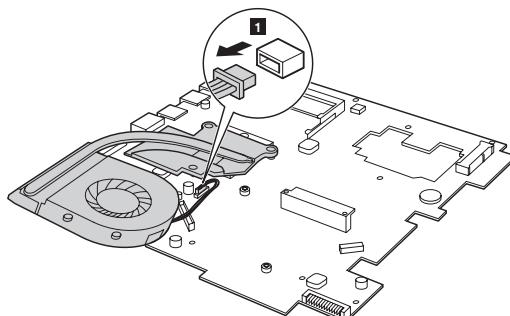



Figure 13. Removal steps of fan assembly and heat sink assembly

Detach the fan connector in the direction shown by arrow **1**.

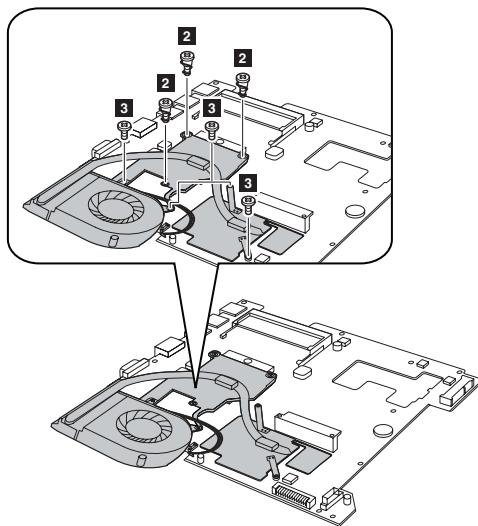
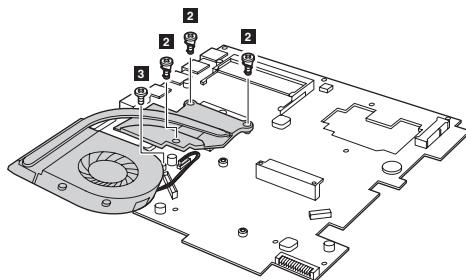
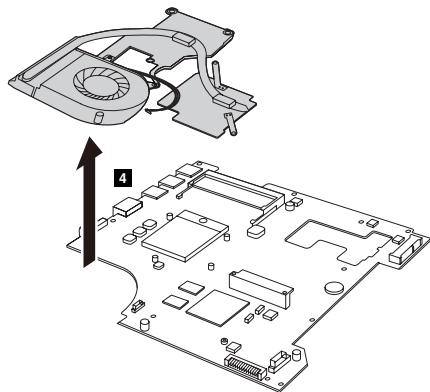
Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Make sure that the fan connector is attached firmly to the system board.

Figure 13. Removal steps of fan assembly and heat sink assembly (continued)

Lenovo G480/G485/G580/G585

Remove the three screws **2** and the four screws **3**.

Lenovo G780

Remove the three screws **2** and the one screw **3**.

Step	Screw (quantity)	Color	Torque
2	M2.0×3.2 mm, flat-head, nylok-coated (3)	Black	2.0-2.5 kgfcm
3	G480/G485/G580/G585: M2.0×3.0 mm, flat-head, nylok-coated (4) G780: M2.0×3.0 mm, flat-head, nylok-coated (1)	Black	1.5-2.0 kgfcm

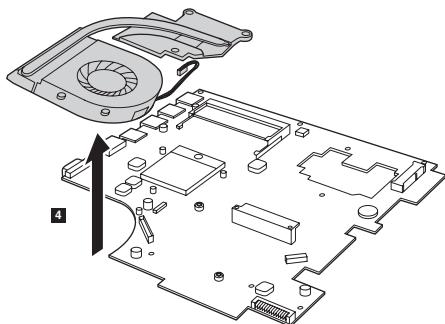
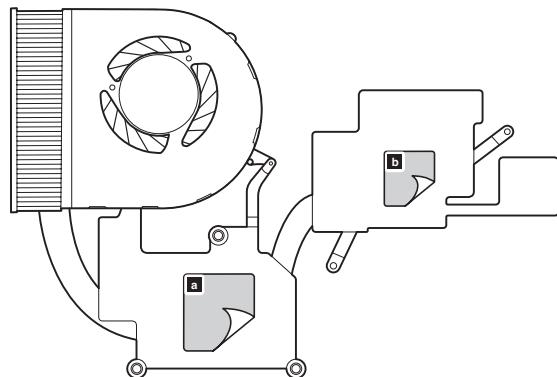
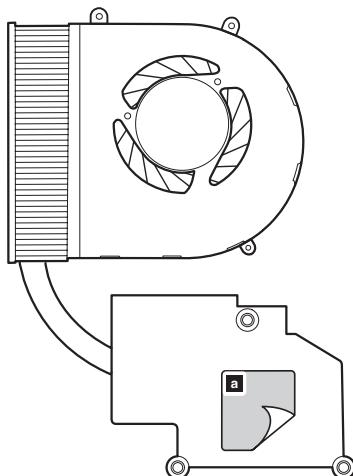



Figure 13. Removal steps of fan assembly and heat sink assembly (continued)

Lift the fan assembly and heat sink assembly in the direction shown by arrow **4**.

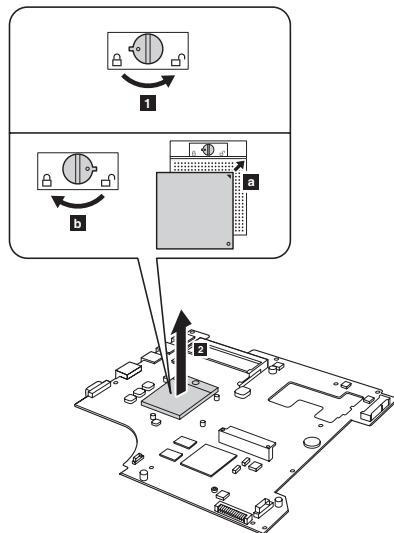
Lenovo G480/G485/G580/G585

Lenovo G780

Note: Be careful not to damage the connector.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Before you attach the fan assembly to the computer, apply thermal grease, at an amount of 0.2 grams, to the **a** **b** part shown in the figure above. Either too much or too less grease application can cause a thermal problem due to imperfect contact with a component.

1140 CPU

For access, remove these FRUs in order:
- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60
- “1130 Fan assembly and Heat Sink assembly” on page 74

Attention: CPU is extremely sensitive. When you service the CPU, avoid any kind of rough handling.

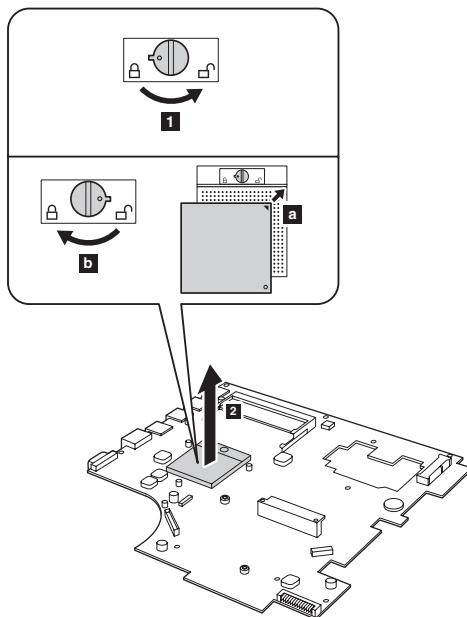
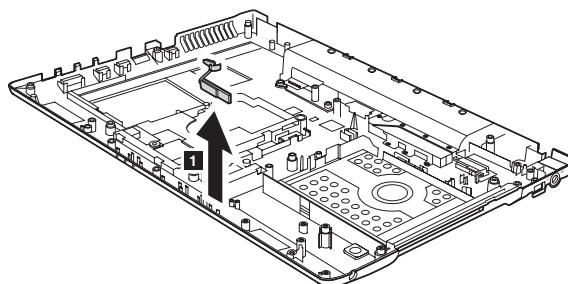



Figure 14. Removal steps of CPU

Rotate the head of the screw in the direction shown by arrow **1** to release the lock, then remove the CPU in the direction shown by arrow **2**.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Place the CPU on the CPU socket in the direction shown by arrow a, and then rotate the head of the screw in the direction shown by arrow b to secure the CPU.

1150 Base cover

For access, remove these FRUs in order:

- "1010 Battery pack" on page 34
- "1020 Dummy card" on page 35
- "1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover" on page 36
- "1040 Hard disk drive" on page 39
- "1050 Optical drive" on page 43
- "1060 DIMM" on page 45
- "1070 PCI Express Mini Card for wireless LAN/WAN" on page 47
- "1080 Keyboard" on page 49
- "1090 Keyboard bezel" on page 52
- "1100 Speakers (Lenovo G480/G485/G580/G585)" on page 59
- "1110 System board" on page 60
- "1120 LCD unit" on page 70

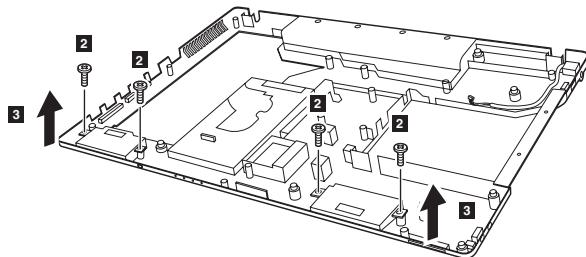



Figure 15. Removal steps of base cover

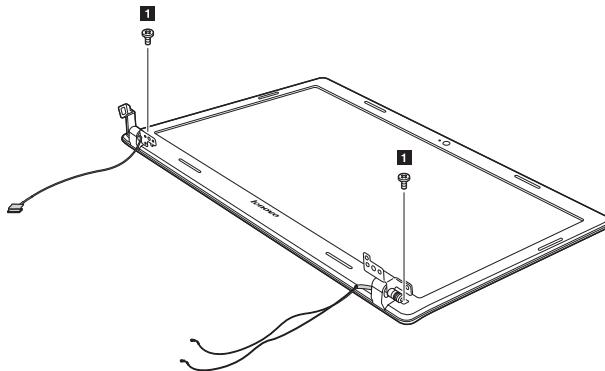
Remove the bluetooth card in the direction shown by arrow **1**.

Figure 15. Removal steps of base cover (continued)

Lenovo G780

Remove the four screws 2. Then remove the speakers by lifting in the direction shown by arrows 3.

Step	Screw (quantity)	Color	Torque
2	M2.0×5.7+2 mm, flat-head, nylok-coated (4)	Black	2.0-2.5 kgfcm

1160 LCD front bezel

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60
- “1120 LCD unit” on page 70

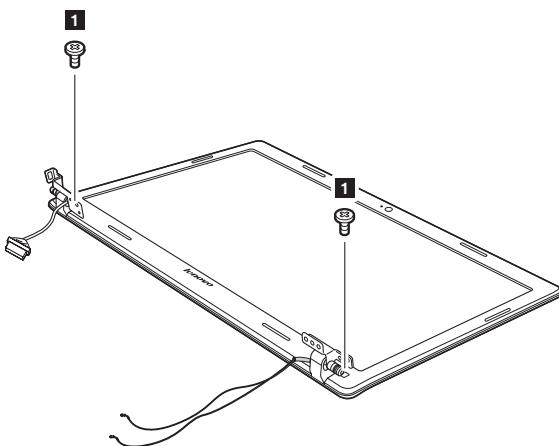
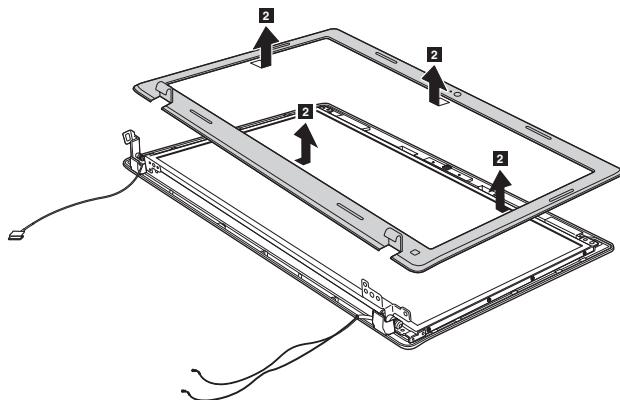



Figure 16. Removal steps of LCD front bezel

Remove the two screws **1**.

Lenovo G480/G485/G580/G585

Lenovo G780

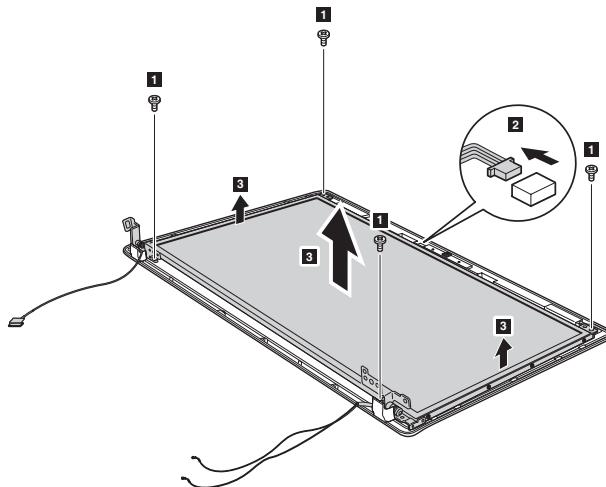
Step	Screw (quantity)	Color	Torque
1	G480/G485/G580/G585: M2.5×6.0 mm, flat-head, nylok-coated (2)	White	2.0-2.5 kgfcm
	G780: M2.5×5.0 mm, flat-head, nylok-coated (2)	Black	2.0-2.5 kgfcm

Figure 16. Removal steps of LCD front bezel (continued)

Remove the LCD front bezel in the direction shown by arrows **2**.

Lenovo G480/G485/G580/G585

Lenovo G780

1170 LCD panel, LCD cable and hinges

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60
- “1120 LCD unit” on page 70
- “1160 LCD front bezel” on page 82

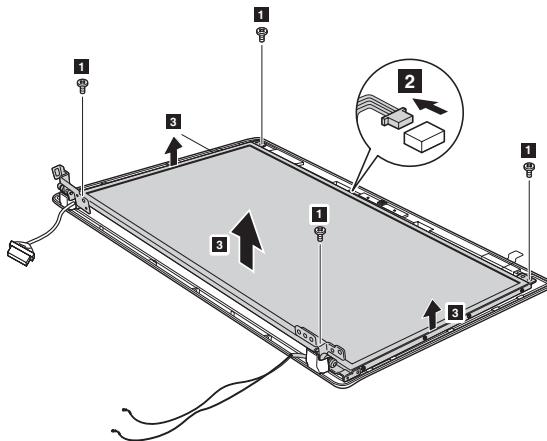
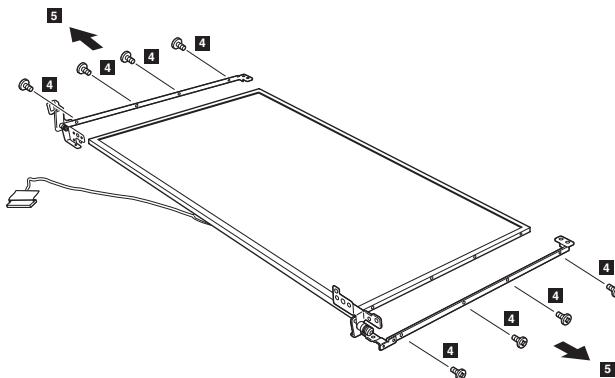
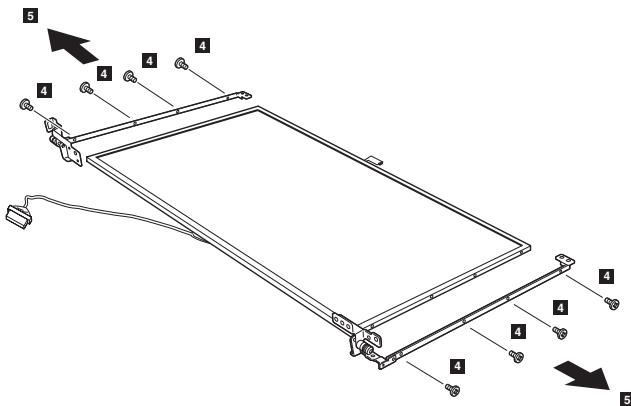



Figure 17. Removal steps of LCD panel, LCD cable and hinges

Remove the four screws **1** to release the LCD panel. Gently lift the LCD panel a little and detach the integrated camera connector in the direction shown by arrow **2**. Remove the LCD panel in the direction shown by arrows **3**.

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
1	M2.5×4.0 mm, flat-head, nylok-coated (4)	Black	2.0-2.5 kgfcm

Figure 17. Removal steps of LCD panel, LCD cable and hinges (continued)

Remove the eight screws **4**, release the hinges from the LCD panel in the direction shown by arrows **5**.

Lenovo G480/G485/G580/G585

Lenovo G780

Step	Screw (quantity)	Color	Torque
4	M2.0×3.0 mm, flat-head, nylok-coated (8)	Black	1.5-2.0 kgfcm

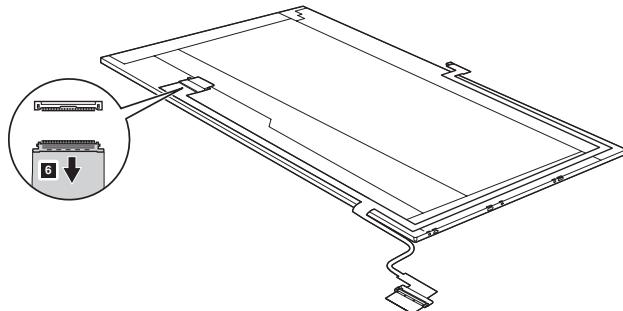
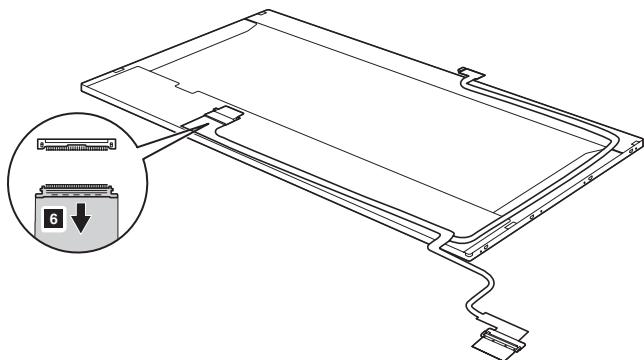



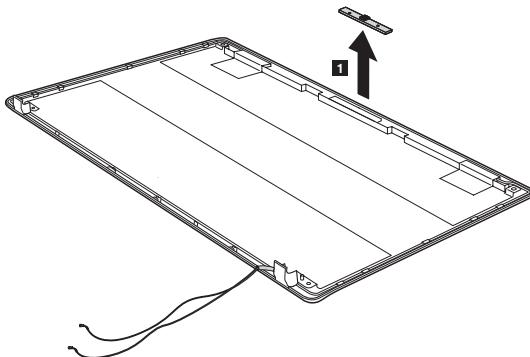
Figure 17. Removal steps of LCD panel, LCD cable and hinges (continued)

Note: The LCD cables are attached to the LCD panel by a metal connector.

Peel off the adhesive tape and detach the connector in the direction shown by arrow **6**.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Make sure that the metal connector is attached firmly.

1180 Integrated camera

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60
- “1120 LCD unit” on page 70
- “1160 LCD front bezel” on page 82
- “1170 LCD panel, LCD cable and hinges” on page 85

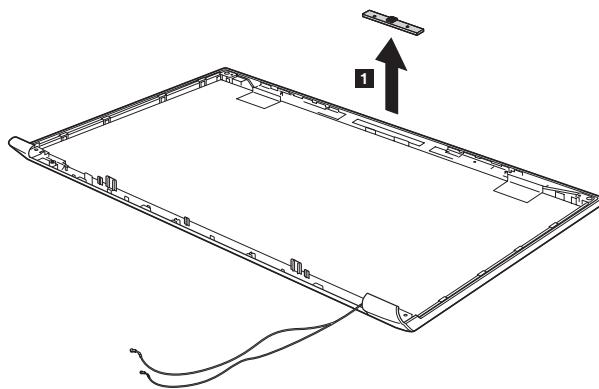



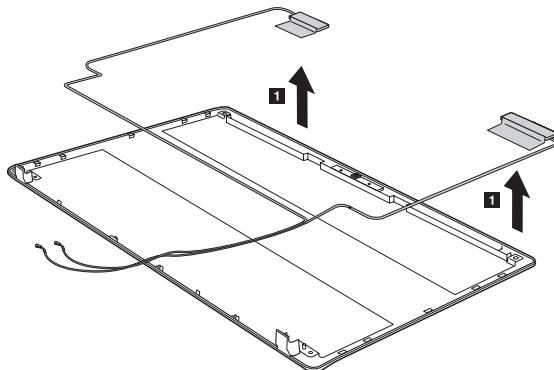
Figure 18. Removal steps of integrated camera

Note: The integrated camera is stuck on the top center of the LCD cover.

Remove the integrated camera from the LCD cover **1**.

Lenovo G480/G485/G580/G585

Lenovo G780

When installing: Stick the integrated camera to the top center of the LCD cover and ajust the placement of it to make sure the connector is attached firmly.

1190 Antenna assembly and LCD cover

For access, remove these FRUs in order:

- “1010 Battery pack” on page 34
- “1020 Dummy card” on page 35
- “1030 Optical drive/Hard disk drive (HDD)/Memory/Central processing unit/Mini PCI Express Card slot compartment cover” on page 36
- “1040 Hard disk drive” on page 39
- “1050 Optical drive” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 47
- “1080 Keyboard” on page 49
- “1090 Keyboard bezel” on page 52
- “1100 Speakers (Lenovo G480/G485/G580/G585)” on page 59
- “1110 System board” on page 60
- “1120 LCD unit” on page 70
- “1160 LCD front bezel” on page 82
- “1170 LCD panel, LCD cable and hinges” on page 85

Figure 19. Removal steps of antenna assembly and LCD cover

Peel off the adhesive tapes securing the antenna boards, release the cables from the cable guide, and then remove the antenna assembly in the direction shown by arrows 1.

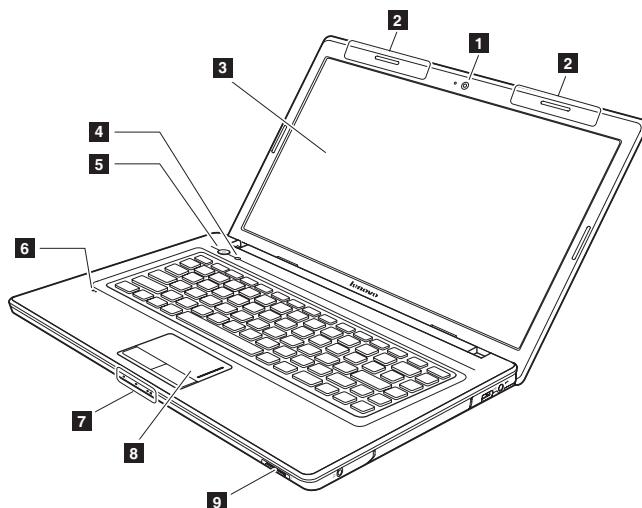
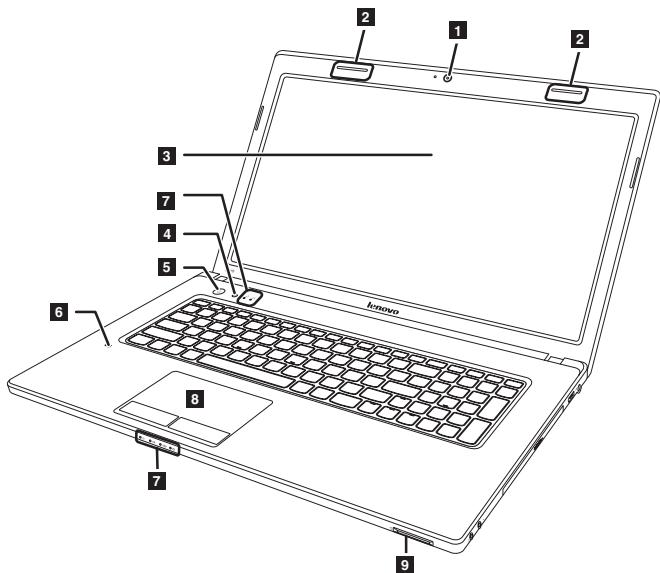
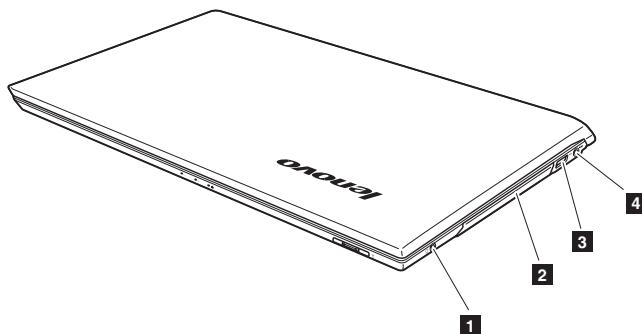
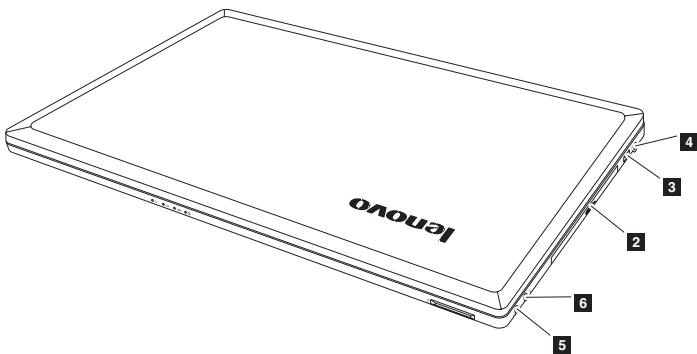
When installing: Route the antenna cables along the cable guides and secure the antenna boards with adhesive tapes. As you route the cables, make sure that they are not subjected to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.

Locations

Front view

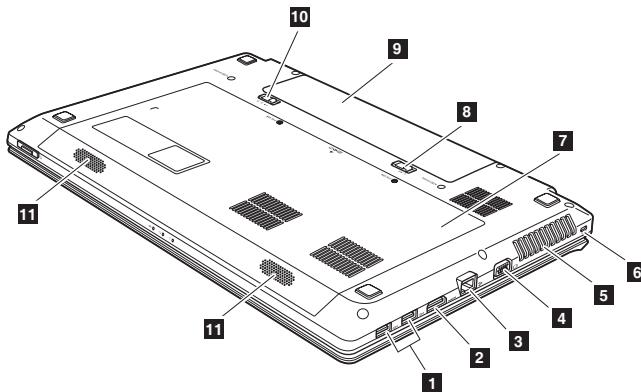
1 Integrated camera
2 Wireless module antennas

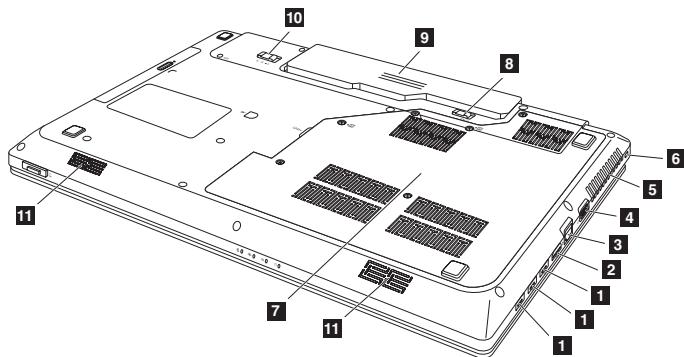
Note: Wireless module antennas may be placed in different positions (2a/2b) depending on different configurations.

3 Computer display
4 OneKey Rescue System button
5 Power button
6 Built-in microphone
7 System status indicators
8 Touchpad
9 Memory card slot

Lenovo G480/G485/G580/G585

Lenovo G780

Right-side view

1 Combo audio jack
2 Optical drive
3 USB port
4 AC power adapter jack
5 Headphone jack
6 Microphone jack

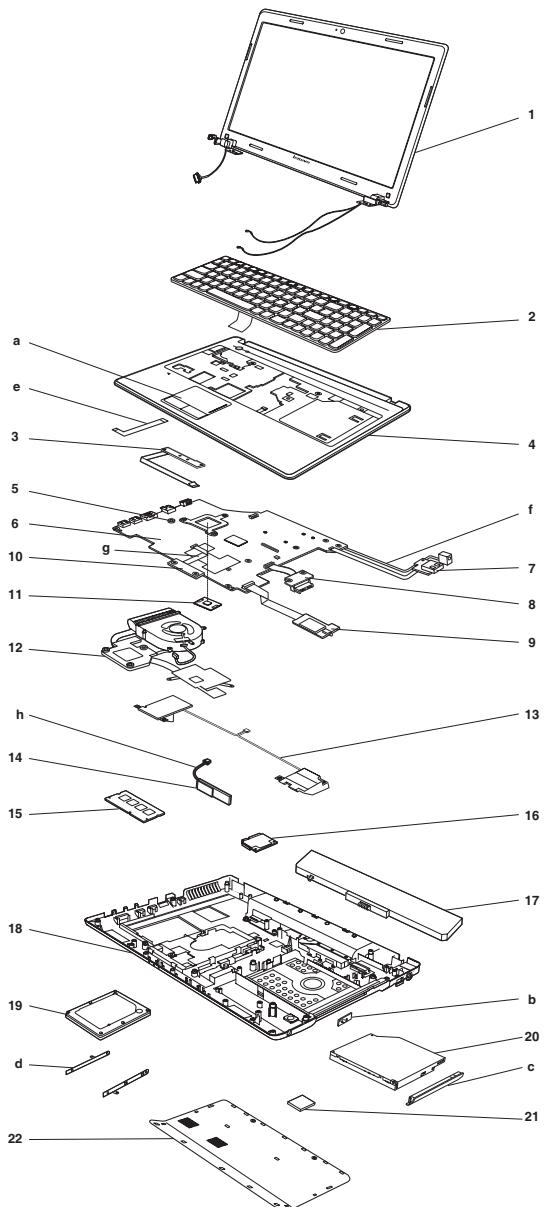
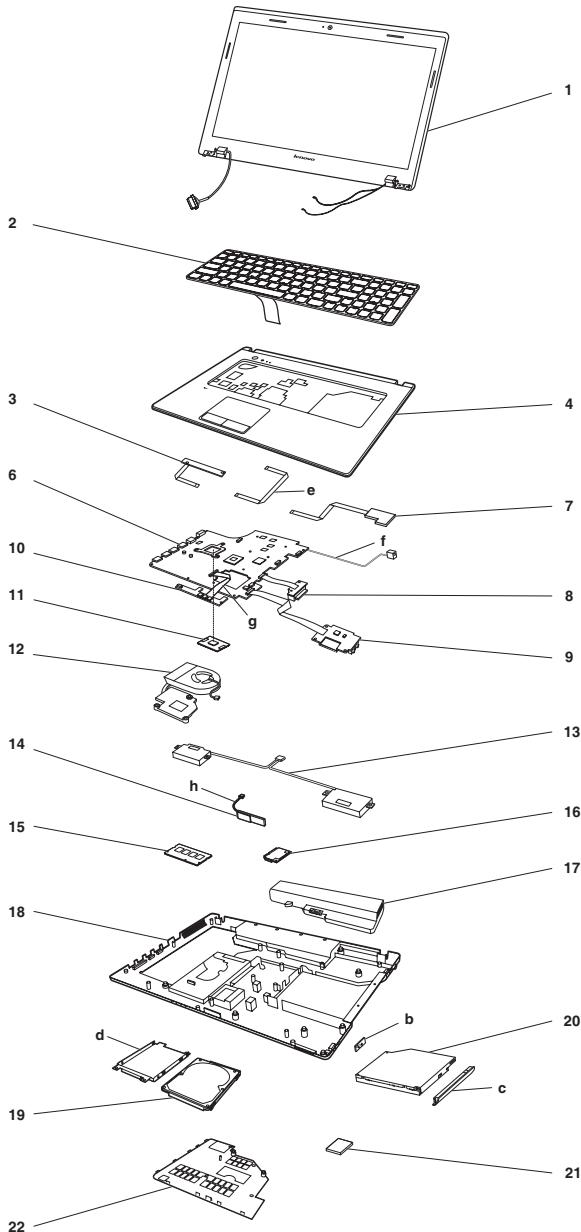
Lenovo G480/G485/G580/G585

Lenovo G780

Bottom and Left-side view

1 USB ports
2 HDMI port (Select models only)
3 RJ-45 port
4 VGA port
5 Fan louvers
6 Kensington slot
7 Optical drive/Hard disk drive (HDD)/Memory/CPU (Central processing unit)/Mini PCI Express Card slot compartment
8 Battery latch - spring loaded
9 Battery pack
10 Battery latch - manual
11 Speaker

Lenovo G480/G485/G580/G585

Lenovo G780

Parts list

This section presents the following service parts:

- "Overall" on page 98
- "LCD FRUs" on page 105
- "Keyboard" on page 108
- "Miscellaneous parts" on page 114
- "AC adapters" on page 115
- "Power cords" on page 116

Notes:
- Each FRU is available for all types or models, unless specific types or models are specified.

Overall

Lenovo G480/G485/G580/G585

Lenovo G780

Table 4. Parts list—Overall

No.	FRU	FRU no.
1	LCD unit (see “LCD FRUs” on page 105.)	
2	Keyboard (see “Keyboard” on page 108.)	
3	QIWG5 Power Board UMA W/Cable (G480/G485)	90200425
3	QIWG5 Power Board DIS W/Cable (G480/G485)	90200426
3	LG48 Power Board W/Cable (G480)	90000300
3	LG58 Power Board W/Cable (G580)	90000308
3	QIWG6 Power Board UMA W/Cable (G580/G585)	90200452
3	QIWG6 Power Board DIS W/Cable (G580/G585)	90200453
3	POWER BOARD W/FFC 17 (G780)	11013580
4	QIWG5 Upper Case High W/TP (G480/G485)	90200421
4	LG48 Upper Case W/TP Gray (G480)	90200957
4	LG48 Upper Case W/TP Red (G480)	90200956
4	LG48 Upper Case W/TP Bule (G480)	90200955
4	LG58 Upper Case W/TP Brown (G580)	90200982
4	LG58 Upper Case W/TP Red (G580)	90200981
4	LG58 Upper Case W/TP Blue (G580)	90200980
4	QIWG6 Upper Case High AM0N2000100 (G580/G585)	90200433
4	LOGIC UP ASSY-17 FOR W/HDMI (G780)	31050104
5	LG48 MicroPhone (G480)	90200973
6	QIWG5 MB DIS N13P-GL 2G 100M W/HDMI (G480/G485)	90000120
6	QIWG5 MB DIS N13M-GE 1G 100M W/HDMI (G480/G485)	90000121
6	QIWG5 MB UMA 100M W/HDMI (G480/G485)	90000122
6	LG48 MB DIS N13M-GE 1G W/BT/HDMI WO/3G (G480)	90000306
6	LG48 MB UMA W/BT/HDMI WO/3G (G480)	90000305
6	LG58 MB DIS N13M-GE 1G W/BT/HDMI WO/3G (G580)	90000311
6	LG58 MB UMA W/BT/HDMI WO/3G (G580)	90000312
6	QIWG6 MB DIS N13P-GL 2G 100M W/HDMI (G580/G585)	90000117
6	QIWG6 MB DIS N13M-GE 1G 100M W/HDMI (G580/G585)	90000118
6	QIWG6 MB UMA 100M W/HDMI (G580/G585)	90000119
6	MB ASSY 17 HDMI MUX 2G USB 3.0 GIGA LAN (G780)	11013581
6	MB ASSY 17 HDMI MUX 2G USB 3.0 10/100 LAN (G780)	11013582
6	MB ASSY 17 HDMI MUX 1G USB 3.0 Giga LAN (G780)	11013583
6	MB ASSY 17 HDMI MUX 1G USB 3.0 10/100 LAN (G780)	11013584
6	MB ASSY 17 HDMI UMA USB 2.0 (G780)	11013585
6	MB UMA C60 10L L-COST (G780)	11014178
7	QIWG5 USB Board W/Cable 455NW438L21 (G480/G485)	90200430
7	QIWG6 USB Board W/Cable 455NW438L01 (G580/G585)	90200456
7	USB BOARD 17 (G780)	11013586
8	QIWG6 ODD Board 455NW638L01 (G580/G585)	90200458
8	LG58 ODD Board W/Cable (G580)	90000310
8	ODD BOARD 17 (G780)	31050110
9	QIWG5 IO Board W/Cable 455M0X38L01 (G480/G485)	90200428
9	LG48 CardReader Board W/Cable (G480)	90000301
9	LG58 CardReader Board (G580)	90000309

Table 4. Parts list—Overall (continued)

No.	FRU	FRU no.
9	QIWG6 IO Board W/Cable 455M0X38L41 (G580/G585)	90200454
9	CARD READER 5 IN 1-17 (G780)	31050105
10	LG48 TouchPad Button Poard (G480)	90000302
10	LG58 TouchPad Button Board (G580)	90000307
10	QIWG6 LED Board W/Cable 455NW538L01 (G580/G585)	90200459
10	LED BOARD 17 (G780)	31050111
11	Intel I7-3612QM 2.1G E1 6M 4cPGA Processor	102500290
11	Intel I7-3520M 2.9G L1 4M 2cPGA Processor	102500295
11	Intel I5-3210M 2.5G L1 3M 2cPGA Processor	102500301
11	Intel I3-3110M 2.3G L1 3M 2cPGA Processor	102500303
11	Intel I5-3360M 2.8G L1 3M 2cPGA Processor	102500297
11	Intel I5-3320M 2.6G L1 3M 2cPGA Processor	102500299
11	Intel I5-2450M 2.5G J1 3M 2cPGA Processor	102500226
11	Intel I3-2370M 2.4G J1 3M 2cPGA Processor	102500228
11	Intel SNB I3-2350M 2.3G 3M J1 PGA Processor	102500018
11	Intel B970 2.3G D2 2M 2cPGA Processor	102500230
11	Intel B960 2.20G 2M 35W SNB PGA Processor	102500133
11	Intel B815 1.6G Q0 2M 2cPGA Processor	102500229
11	Intel SNB B800 1.5G Q0 2M 2c PGA Processor	102500101
12	QIWG5 Thermal Module DIS N13M-GE W/FAN	90200418
12	QIWG5 Thermal Module DIS N13P-GL W/FAN	90200419
12	QIWG5 Thermal Module UMA W/FAN	90200420
12	LG48 Thermal Module DIS W/FAN (G480)	90200972
12	LG48 Thermal Module UMA W/FAN (G480)	90200971
12	LG58 Thermal Module DIS W/FAN (G580)	90200995
12	LG58 Thermal Module UMA W/FAN (G580)	90200996
12	THERMAL MODULE-DIS 17 (G780)	31050101
12	THERMAL MODULE-UMA 17 (G780)	31050102
12	FAN UMA 17 (G780)	31050103
13	LG48 Speaker (G480)	90200975
13	LG58 Speaker (G580)	90200997
13	QIWG5 Speaker PK23000HH00 (G480/G485)	90200429
13	QIWG6 Speaker PK23000HI00 (G580/G585)	90200455
13	SPEAKER-17 (G780)	31050107
14	BT4.0, CyberTan, Cbt BCM920702 BT4.0 EDR Flash U NB BT card	20200056
14	BT4.0, Liteon, Ltn BCM920702 BT4.0 EDR Flash U NB BT card	20200057
15	RAM, DDR3 1600 2GB, Samsung, M471B5773DH0-CK0 DDR3 1600 2GB	11200340
15	RAM, DDR3 1600 2GB, Hynix, HMT325S6CFR8C-PB DDR3 1600 2GB	11200343
15	RAM, DDR3 1600 2GB, Micron, MT8KTF25664HZ-1G6M1 DDR3 1600 2GB	11200346
15	RAM, DDR3 1600 2GB, Ramaxel, RMT3150ED58E8W-1600 DDR3 1600 2GB	11200392
15	RAM, DDR3 1600 2GB, Sharetronic(Micron), SM321NH08IAF DDR3 1600 2GB	11200396

Table 4. Parts list—Overall (continued)

No.	FRU	FRU no.
15	RAM, DDR3 1600 4GB, Samsung, M471B5273DH0-CK0 DDR3 1600 4GB	11200341
15	RAM, DDR3 1600 4GB, Micron, MT16KTF51264HZ-1G6M1 DDR3 1600 4GB	11200347
15	RAM, DDR3 1600 4GB, Hynix, HMT351S6CFR8C-PB DDR3 1600 4GB	11200344
15	RAM, DDR3 1600 4GB, Ramaxel, RMT3160ED58E9W-1600 DDR3 1600 4GB	11200393
15	RAM, DDR3 1600 4GB, Sharetronic(Micron), SM322NQ08IAF DDR3 1600 4GB	11200397
16	WLAN, WiFi 1x2 BGN + WiMAX, Intel 6150NX MOW M PCIE NB HMC (LI)	20002484
16	Intel 6150NX BSB M PCIE NB HMC (LI)	20002543
16	WLAN, WiFi 1x1 BGN, Cbt BCM4313 MOW M PCIE NB HMC	20002505
16	WLAN, WiFi 1x1 BGN, Liteon AR9285 HB95 BGN MOW NB	20002357
16	WLAN, WiFi 1x1 BGN+BT4.0, Cbt BCM4313HMGB BGN+BT HMC	20002501
16	WLAN, WiFi 1x1 BGN+BT3.0, Liteon WB195 BGN+BT HMC	20002524
17	Battery, 6cell 4400mAh 48Wh, SMP/S L11M6Y01 3S2P 48Wh battery Comm02	121500043
17	Battery, 6cell 4400mAh 48Wh, Sanyo L11S6Y01 3S2P 48Wh battery Comm02	121500040
17	Battery, 6cell 4400mAh 48Wh, LG L11L6Y01 3S2P 48Wh battery Comm02	121500042
17	Battery, 6cell 4400mAh 48Wh, Sony L11N6Y01 3S2P 48Wh battery Comm02	121500041
17	Battery, cell 4400mAh 48Wh, Sanyo L09S6Y02 3S2P 48Wh bty(LH)Comm01 (G780)	121001091
17	Battery, cell 4400mAh 48Wh, LG L09L6Y02 3S2P 48Wh bty(LH)Comm01 (G780)	121001089
17	Battery, cell 4400mAh 48Wh, G470 Sony L10N6Y02 48Wh 3S2P Bty (G780)	121001056
17	Battery, cell 4400mAh 48Wh, SMP/LG L09M6Y02 3S2P 48Wh bty(LH)Comm01 (G780)	121001094
18	QIWG5 Lower Case AP0N1000100 (G480/G485)	90200435
18	LG48 Lower Case (G480)	90200959
18	LG58 Lower Case (G580)	90200989
18	QIWG6 Lower Case AP0N2000100 (G580/G585)	90200460
18	LOGIC LOWER 17 FOR W/HDMI (G780)	31050112
19	HDD, 320G 5400rpm, WD ML320-AF2, WD WD3200BPVT 5400RPM	16200022
19	HDD, 320G 5400rpm, HGST(Jaquar B7), HGST HTS545032A7E380 5400PRM7mm	16200068
19	HDD, 320G 5400rpm, Seagate Sapta 15, Seagate ST320LT020 5400RPM 7MM	16005211
19	HDD, 320G 5400rpm, Toshiba Capricorn BS (H6sp), Toshiba MK3265GSX 5400RPM	16004642

Table 4. Parts list—Overall (continued)

No.	FRU	FRU no.
19	HDD, 500G 5400rpm, WD (ML375M), WD WD5000BPVT-24HXZ 5400RPM	16004846
19	HDD, 500G 5400rpm, Seagate Waytt, Seagate ST9500325AS 500G 9NB	16004189
19	HDD, 500G 5400rpm, HGST (Jaquar B7), HGST HTS545050A7E380 5400PRM7mm	16200067
19	HDD, 500G 5400rpm, Toshiba Capricorn BS (H6sp), Toshiba MK5065GSX 5400RPM	16004643
19	HDD, 500G 5400rpm, WD (ML500M), WD WD5000BPVT-24A1YT0 5400PRM 9.5mm	16200089
19	HDD, 500G 5400rpm, Seagate, ST500LM012 5.4K RPM 9.5mm	16200210
19	HDD, 750G 5400rpm, WD(ML375M), WD7500BPVT-24HXZ 5400RPM	16004848
19	HDD, 750G 5400rpm, HGST Jaquar B, HTS541075A9E680 9.5 5.4K	16200192
19	HDD, 750G 5400rpm, Seagate Desaru 5, Seagate ST9750423AS 5400RPM	16005333
19	HDD, 750G 5400rpm, Toshiba(Capricorn 3 BS), Toshiba MK7575GSX 5400RPM	16005334
19	HDD, 750G 5400rpm, WD (ML500M), WD WD7500BPVT-24A1YT0 5400PRM 9.5mm	16200088
19	HDD, 750G 5400rpm, Seagate, ST750LM022 5.4K RPM 9.5mm	16200209
19	HDD, 1TB 5400rpm, WD ML500M, WD WD10JPVT-24A1YT0 5400PRM 9.5mm	16200071
19	HDD, 1TB 5400rpm, HGST Jaquar B, HTS541010A9E680 9.5 5.4K	16200193
19	HDD, 1TB 5400rpm, Seagate, ST1000LM024 5.4K RPM 9.5mm	16200208
19	HDD, 320G 7200rpm, HGST Jaquar C7, HTS725032A7E630 7MM 7.2K	16200194
19	HDD, 320G 7200rpm, Seagate Julius 1 4K, Seagate ST320LT007 7200RPM 7MM	16005030
19	HDD, 320G 7200rpm, WD (MX320S-1), WD WD3200BEKT 7200RPM	16005212
19	HDD, 320G 7200rpm, Toshiba Capricorn CS, TSB MK3261GSY 7200PRM 9.5mm	16200087
19	HDD, 500G 7200rpm, Seagate Desaru, Seagate ST9500423AS 7200RPM	16200020
19	HDD, 500G 7200rpm, HGST Jaquar C7, HTS725050A7E630 7MM 7.2K	16200195
19	HDD, 500G 7200rpm, WD MX375M, WD WD5000BPKT 7200RPM	16200004
19	HDD, 500G 7200rpm, Toshiba Capricorn CS, TSB MK5061GSY 7200PRM 9.5mm	16200086
19	HDD, 320G 5400rpm, ST320LT012 5.4K 7mm 320G HDD (G780)	16200212
19	HDD, 500G 5400rpm, ST500LM012 5.4K 7mm 500G HDD (G780)	16200211
20	ODD, 12.7MM Rambo, PLDS DS-8A8SH Tray in Rambo ODD	25201487
20	ODD, 12.7MM Rambo, TSST SN-208AB Tray in Rambo ODD	25201108
20	ODD, 12.7MM Rambo, Optiarc AD-7740H Tray in Rambo ODD	25201106
20	ODD, 12.7MM Rambo, PSN UJ8C1 Tray in Rambo ODD	25201499
20	ODD, BD Rambo, PSN UJ260 Tray in BD Rambo ODD	25201633
20	ODD, BD Rambo, Optiarc BD-5750H-L8 Tray in BD Rambo ODD	25201494
20	ODD, BD Rambo, HLDS BT20N Tray in BD Rambo ODD	25201634

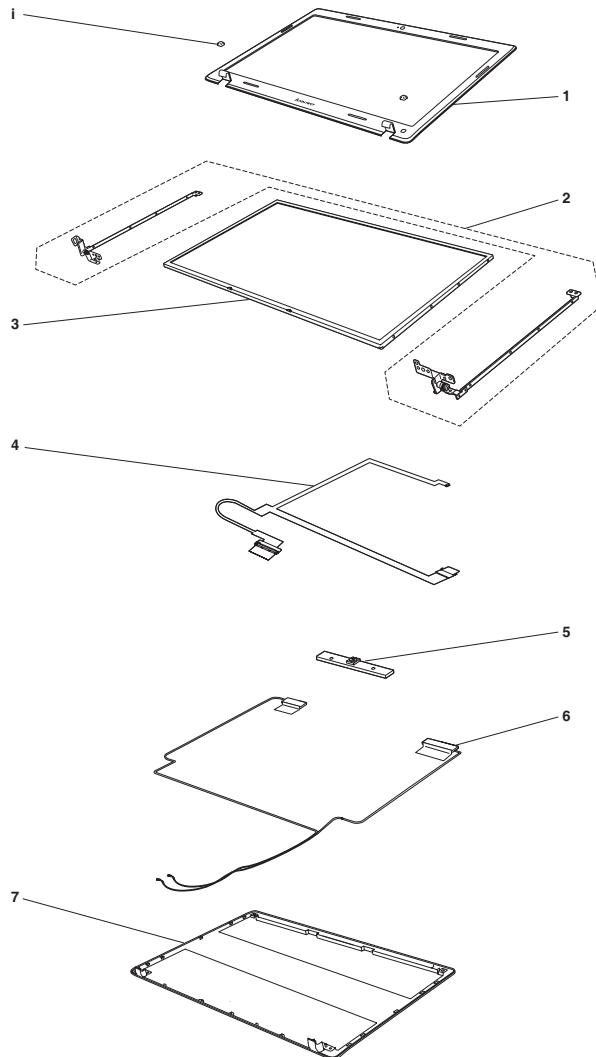



Table 5. Parts list—Overall (continued)

No.	FRU	FRU no.
21	QIWG5 SD Dummy Card FA0N1000F00	90200427
21	LG48 SD Dummy Card (G480)	90200958
21	LG58 SD Dummy (G580)	90200988
21	SD 5IN1 DUMMY CARD (G780)	31048226
21	SD 2IN1 DUMMY CARD (G780)	31048227
22	QIWG5 Thermal Door AP0N1000200 (G480/G485)	90200413
22	QIWG6 Thermal Door AP0N2000200 (G580/G585)	90200432
22	LG48 RAM Door (G480)	90200953
22	LG58 RAM Door (G580)	90200979
22	THERMAL DOOR 17 (G780)	31050100
-	AC adapter (see “AC adapters” on page 115.)	

LCD FRUs

In Lenovo G480/G485/G580/G585/G780, there are following types of LCDs.

- "14.0-in. HD TFT" (G480/G485)
- "15.6-in. HD TFT" (G580/G585)
- "17.3-in. HD TFT" (G780)

14.0-in. HD TFT

Table 5. Parts list—14.0-in. HD TFT

No.	FRU	FRU no.
1	QIWG5 LCD Bezel AP0N1000500	90200437
1	LG48 LCD Bezel (G480)	90200965
2	LG48 Hinge R+L (G480)	90200961
2	QIWG5 Higne R+L AM0N1000200/300	90200438
3	Panel, 14.0" Wedge, LGD LP140WH4-TLN1 HD G W LED1 NB LCD	18200156
3	Panel, 14.0" Wedge, SEC LTN140AT26-L01 HD G W LED1 NB LCD	18200229
3	Panel, 14.0" Wedge, AUO B140XW01 V8 3A HD G W LED1 NB LCD	18200207
3	Panel, 14.0" Wedge, CMI N140BGE-L22 HD G W LED1 NB LCD	18200155
3	Panel, 14.0" Wedge, BOE HB140WX1-100 HD G W LED1 NB LCD	18200154
3	Panel, 14.0" Wedge, IVO M140NWR2 R1 HD G W LED1 NB LCD	18004793
4	QIWG5 LCD Cable DIS DC02001EQ00	90200439
4	QIWG5 LCD Cable UMA DC02001ER00	90200440
4	LG48 LCD Cable (G480)	90200950
5	HD Camera, BISON, BIS BN1T16YVM HD NB camera	73040524
5	HD Camera, CCY, CCY CNFB161 HD NB camera	73040523
5	HD Camera, BISON, BN1TM6ST3 HD NB camera	73040574
5	HD Camera, CCY, CCY CNFB181 HD NB camera	73040688
5	0.3M, BISON, BIS BN1TVTYV9 0.3M NB camera	73040530
5	0.3M, CCY, CCY CNFB027 0.3M NB camera	73040529
5	LG48 Camera 1M (G480)	90000303
5	LG48 Camera 0.3M (G480)	90000304
6	LG48 Antenna R (G480)	90200969
6	LG48 Antenna L (G480)	90200970
6	QIWG5 Antenna 2 DC33000YF00	90200447
7	QIWG5 LCD Cover MBH AP0N1000410/1/2/3/4	90200449
7	LG48 LCD Cover Gray (G480)	90200968
7	LG48 LCD Cover Red (G480)	90200967
7	LG48 LCD Cover Blue (G480)	90200966

15.6-in. HD TFT

Table 5. Parts list—15.6-in. HD TFT

No.	FRU	FRU no.
1	QIWG6 LCD Bezel AP0N2000100	90200461
1	LG58 LCD Bezel (G580)	90200987
2	LG58 Hinge L+R (G580)	90200990
2	QIWG6 Hinge R+L AM0N2000200/300	90200462
3	Panel, 15.6" Wedge, LGD, LP156WH4-TLN1	18200158
3	Panel, 15.6" Wedge, SEC, SEC LTN156AT24-L01 HD G W LED1 NB LCD	18200114
3	Panel, 15.6" Wedge, AUO, B156XTN02.0	18200157
3	Panel, 15.6" Wedge, CMI, N156BGE-L21	18004787
4	QIWG6 LCD Cable DIS DC02001ES00	90200463
4	QIWG6 LCD Cable UMA DC02001ET00	90200464
4	LG58 LCD Cable (G580)	90200978
5	QIWG5 Camera 1M PK40000GR10/GP10/H400	90200441
5	QIWG5 Camera 0.3M PK40000GT10/GQ10	90200445
6	QIWG6 Antenna 2 DC33000YF00/10	90200465
6	LG58 Antenna L (G580)	90200993
6	LG58 Antenna R (G580)	90200994
7	LG58 LCD Cover Brown (G580)	90200986
7	LG58 LCD Cover Red (G580)	90200984
7	LG58 LCD Cover Blue (G580)	90200985
7	QIWG6 LCD Cover MBH AP0N2000410/1/2/3/4	90200467

17.3-in. HD TFT

Table 5. Parts list—17.3-in. HD TFT

No.	FRU	FRU no.
1	LCD BEZEL 17 W/CMOS	31050113
2	LCD HINGE 17 R+L	31050114
3	Panel, 17.3" Wedge, SEC LTN173KT02-L01 HD+ G W LED1 NB LCD	18200159
3	Panel, 17.3" Wedge, AUO B173RW01 V5 HD+ G W LED1 NB LCD	18200208
3	Panel, 17.3" Wedge, CMI N173FGE-L23 HD+ G W LED1 NB LCD	18200384
4	LVDS CABLE 17	31050115
5	CMOS 2.0M	90200511
5	CMOS 0.3M	31048206
6	WLAN ANTENNA 17 R+L	31050116
7	LCD COVER-17 IMR	31050117
7	LCD COVER RUBBER	31048207

Keyboard

Table 6. Parts list—Keyboard

Language			P/N
G480/G485	Chicony	English	25201993
		U.K. English	25201996
		Italian	25201998
		Spanish	25202000
		Turkish	25202002
		Thai	25202005
		Portuguese	25202007
		Latin	25202008
		Canadian English&French	25202011
		Korean	25202013
		Traditional Chinese	25202014
		Russian	25202017
		French	25202019
		German	25202021
		Arabic	25202023
		Brazilian	25202025
		Japanese	25202028
		Dutch	25202030
		Greek	25202032
		Hebrew	25202034
		Hungarian	25202035
		Four Nordic countries	25202038
		Belgian	25202039
		Icelandic	25202041
		Slovenian	25202043
		Swiss	25202046
		International English	25202048
		Czechoslovakian	25202050
		Bulgarian	25202052
		Indic	25202054
	Sunrex	English	25202056
		U.K. English	25202058
		Italian	25202059
		Spanish	25202061
		Turkish	25202063
		Thai	25202065
		Portuguese	25202068
		Latin	25202070
		Canadian English&French	25202072
		Korean	25202074
		Traditional Chinese	25202076
		Russian	25202078
		French	25202080
		German	25202082
		Arabic	25202085

Table 6. Parts list—Keyboard (continued)

Language			P/N
G480/G485 (continued)	Sunrex (continued)	Brazilian	25202087
		Japanese	25202089
		Dutch	25202091
		Greek	25202092
		Hebrew	25202094
		Hungarian	25202097
		Four Nordic countries	25202099
		Belgian	25202101
		Icelandic	25202103
		Slovenian	25202105
		Swiss	25202107
		International English	25202110
		Czechoslovakian	25202112
		Bulgarian	25202114
		Indic	25202116
	Darfon	English	25202118
		U.K. English	25202120
		Italian	25202122
		Spanish	25202124
		Turkish	25202126
		Thai	25202128
		Portuguese	25202130
		Latin	25202133
		Canadian English&French	25202134
		Korean	25202136
		Traditional Chinese	25202139
		Russian	25202141
		French	25202143
		German	25202145
		Arabic	25202147
		Brazilian	25202149
		Japanese	25202150
		Dutch	25202153
		Greek	25202155
		Hebrew	25202156
		Hungarian	25202158
		Four Nordic countries	25202160
		Belgian	25202162
		Icelandic	25202165
		Slovenian	25202166
		Swiss	25202168
		International English	25202170
		Czechoslovakian	25202172
		Bulgarian	25202174
		Indic	25202176

Table 6. Parts list—Keyboard

Language			P/N
G580/G585	Chicony	English	25201816
		U.K. English	25201817
		Italian	25201818
		Spanish	25201819
		Turkish	25201820
		Thai	25201821
		Portuguese	25201822
		Latin	25201823
		Canadian English&French	25201824
		Korean	25201825
		Traditional Chinese	25201826
		Russian	25201827
		French	25201828
		German	25201829
		Arabic	25201830
		Brazilian	25201831
		Japanese	25201832
		Dutch	25201833
		Greek	25201834
		Hebrew	25201835
		Hungarian	25201836
		Four Nordic countries	25201837
		Belgian	25201838
		Icelandic	25201839
		Slovenian	25201840
		Swiss	25201841
		International English	25201842
		Czechoslovakian	25201843
		Bulgarian	25201844
		Indic	25201845
	Sunrex	English	25201846
		U.K. English	25201847
		Italian	25201848
		Spanish	25201849
		Turkish	25201850
		Thai	25201851
		Portuguese	25201852
		Latin	25201853
		Canadian English&French	25201854
		Korean	25201855
		Traditional Chinese	25201856
		Russian	25201857
		French	25201858

Table 6. Parts list—Keyboard (continued)

Language			P/N
G580/G585 (continued)	Sunrex (continued)	German	25201859
		Arabic	25201860
		Brazilian	25201861
		Japanese	25201862
		Dutch	25201863
		Greek	25201864
		Hebrew	25201865
		Hungarian	25201866
		Four Nordic countries	25201867
		Belgian	25201868
		Icelandic	25201869
		Slovenian	25201870
		Swiss	25201871
		International English	25201872
		Czechoslovakian	25201873
		Bulgarian	25201874
		Indic	25201875
	Darfon	English	25201876
		U.K. English	25201877
		Italian	25201878
		Spanish	25201879
		Turkish	25201880
		Thai	25201881
		Portuguese	25201882
		Latin	25201883
		Canadian English&French	25201884
		Korean	25201885
		Traditional Chinese	25201886
		Russian	25201887
		French	25201888
		German	25201889
		Arabic	25201890
		Brazilian	25201891
		Japanese	25201892
		Dutch	25201893
		Greek	25201894
		Hebrew	25201895
		Hungarian	25201896
		Four Nordic countries	25201897
		Belgian	25201898
		Icelandic	25201899
		Slovenian	25201900
		Swiss	25201901
		International English	25201902
		Czechoslovakian	25201903
		Bulgarian	25201904
		Indic	25201905

Table 6. Parts list—Keyboard

Language			P/N
G780	Chicony	English	25012186
		U.K. English	25012359
		Italian	25012358
		Spanish	25012357
		Turkish	25012356
		Thai	25012355
		Portuguese	25012354
		Latin	25012353
		Canadian English&French	25012352
		Korean	25012351
		Traditional Chinese	25012350
		Russian	25012349
		French	25012348
		German	25012347
		Arabic	25012346
		Brazilian	25012345
		Japanese	25012344
		Dutch	25012343
		Greek	25012342
		Hebrew	25012341
		Hungarian	25012340
		Four Nordic countries	25012339
		Belgian	25012338
		Icelandic	25012337
		Slovenian	25012336
		Swiss	25012335
		International English	25012334
		Czechoslovakian	25012333
		Bulgarian	25012332
		Indic	25200315
	Sunrex	English	25012185
		U.K. English	25012446
		Italian	25012445
		Spanish	25012444
		Turkish	25012443
		Thai	25012442
		Portuguese	25012441
		Latin	25012440
		Canadian English&French	25012439
		Korean	25012438
		Traditional Chinese	25012437
		Russian	25012436
		French	25012435
		German	25012434
		Arabic	25012433

Table 6. Parts list—Keyboard (continued)

Language			P/N
G780 (continued)	Sunrex (continued)	Brazilian	25012432
		Japanese	25012431
		Dutch	25012430
		Greek	25012429
		Hebrew	25012428
		Hungarian	25012427
		Four Nordic countries	25012426
		Belgian	25012425
		Icelandic	25012424
		Slovenian	25012423
		Swiss	25012422
		International English	25012421
		Czechoslovakian	25012420
		Bulgarian	25012419
		Indic	25200370
	Darfon	English	25012184
		U.K. English	25012624
		Italian	25012623
		Spanish	25012622
		Turkish	25012621
		Thai	25012620
		Portuguese	25012619
		Latin	25012618
		Canadian English&French	25012617
		Korean	25012418
		Traditional Chinese	25012417
		Russian	25012404
		French	25012415
		German	25012414
		Arabic	25012413
		Brazilian	25012412
		Japanese	25012411
		Dutch	25012410
		Greek	25012416
		Hebrew	25012409
		Hungarian	25012408
		Four Nordic countries	25012407
		Belgian	25012406
		Icelandic	25012405
		Slovenian	25012403
		Swiss	25012402
		International English	25012401
		Czechoslovakian	25012400
		Bulgarian	25012399
		Indic	25200371

Miscellaneous parts

Table 7. Parts list—Miscellaneous parts

FRU	P/N
System miscellaneous parts:	
• (a) LG48 TP Bracket (G480)	90200954
• (a) LG58 TouchPad Bracket (G580)	90200983
• (b) QIWG5 ODD Bracket AM0N1000500	90200416
• (b) LG48 ODD Bracket	90200962
• (b) ODD BRACKET (G780)	31048211
• (c) QIWG5 ODD Bezel Rambo AP0N1000300	90200415
• (c) QIWG5 ODD Bezel Blue Ray AP0N1000310	90200414
• (c) LG48 ODD Bezel (G480)	90200963
• (c) LG58 ODD Bezel (G580)	90200991
• (c) ODD BEZEL-BLUE RAY (G780)	31048209
• (c) ODD BEZEL-RAMBO (G780)	31048210
• (d) LG48 HDD Bracket (G480)	90200964
• (d) LG58 HDD Bracket (G580)	90200992
• (d) QIWG5 HDD Bracket AM0N1000100	90200417
• (d) HDD BRACKET (G780)	31048225
• (i) LG48 LCD Bezel Screw Pad (G480)	90200974
Cable miscellaneous parts:	
• (e) QIWG5 TP Cable NBX00011H00 (G480/G485)	90200423
• (e) LG48 TP Cable (G480)	90200951
• (e) LG58 TouchPad Cable (G580)	90200977
• (e) QIWG6 TP Cable NBX00011M00 (G580/G585)	90200450
• (e) TP FFC 17 (G780)	31050108
• (f) QIWG5 DC-IN Cable DC30100H700 (G480/G485)	90200431
• (f) QIWG6 DC-IN Cable 455NW438L01 (G580/G585)	90200457
• (f) DC-IN CABL 17 (G780)	31050109
• (g) LG48 TP Button Board Cable (G480)	90200952
• (g) LG58 TP Button Board Cable (G580)	90200976
• (h) QIWG5 BT Cable DC02001EV00 (G480/G485)	90200424
• (h) LA57 BT CABLE	31048987
• (h) QIWG6 BT Cable DC02001EX00 (G580/G585)	90200451
• (h) BT CABLE-17 (G780)	31050106
Note: Italicized letters in parentheses are references to the exploded view in “Overall” on page 98.	

AC adapters

Table 8. Parts list—3-pin AC adapters

FRU	P/N
AC Adaptor, 65W, Delta ADP-65KH BD 20V/3.25A	36001929
AC Adaptor, 65W, Liteon PA-1650-56LC	36001651
AC Adaptor, 65W, Liteon Brazil PA-1650-52LB	36001714
AC Adaptor, 65W, Delta ADP-65KH B 20V,3.25A	36002066
AC Adaptor, 65W, Chicony CPA-A065 20V3.25A(330PF)	36001943
AC Adaptor, 90W, Delta ADP-90DD BD 20V4.5A	36001941
AC Adaptor, 90W, Liteon PA-1900-56LC 20V4.5A (330PF)	36001927
AC Adaptor, 90W, Chicony CPA-A090 20V4.5A (330PF)	36001942

Power cords

A Lenovo power cord for a specific country or region is usually available only in that country or region:

Table 9. Parts list—3-pin power cords

Region	P/N
CCC • 3PIN LINETEK PC323+RVV300/300+LS15 1m	145000600
Argentina • 3PIN LINETEK LS15+H03VV-F+LP39 1m	145000599
Danmark • 3PIN LINETEK LS15+H03VV-F+LP-38 1m	145000598
Switzerland • 3PIN LINETEK LS15+H03VV-F+LP-37 1m	145000597
Brazil • 3PIN LINETEK LS15 H03VV-F LP26A 1m	145000596
Israel • 3PIN LINETEK LS15+H03VV-F+LP-41 1m	145000595
UL • 3PIN LINETEK LP-30B + SPT-2 + LS15 1m	145000594
UK • 3PIN LINETEK LP-61L+ H03VV-F+ LS15 1m	145000593
Indian • 3PIN LINETEK PE-361+ H05VV-F+ LS15 1m	145000592
Italy • 3PIN LINETEK LS15+H03VV-F+PE-336 1m	145000591
Korea • 3PIN LINETEK LS15+H05VV-F+LP-E04A 1m	145000590
Australia • 3PIN LINETEK LS15+H03VV-F+LP-23A 1m	145000589
Taiwan • 3PIN LINETEK LS15+VCTF+LP-53 1m	145000588
Japan • 3PIN LINETEK LS15+VCTF+LP-54 1m	145000587
Africa • 3PIN LINETEK LS15+H03VV-F+PE-364 1m	145000586
CE • 3PIN LINETEK LP-34+H03VV-F + LS15 1m	145000585
CCC • 3PIN Longwell LSG-31+RVV300/300+LS-18 1m	145000568
Argentina • 3PIN Longwell LP-24+H03VV-F+LS-18 1m	145000567
Danmark • 3PIN Longwell LP-40+H03VV-F+LS-18 1m	145000566
Switzerland • 3PIN Longwell LP-37+H03VV-F+LS-18 1m	145000565
Brazil • 3PIN Longwell LP-46+H03VV-F+LS-18 1m	145000564

Table 9. Parts list—3-pin power cords (continued)

Region	P/N
Israel • 3PIN Longwell LP-41+H03VV-F+LS-18 1m	145000563
UL • 3PIN Longwell LP-30B+SPT-2 18AWG+LS-18 1m	145000562
UK • 3PIN Longwell LP-61L+H03VV-F+LS-18 1m	145000561
Indian • 3PIN Longwell LP-67+BIS+LS-18 1m	145000560
Italy • 3PIN Longwell LP-22+H03VV-F+LS-18 1m	145000559
Korea • 3PIN Longwell LP-486+KTLH03VV-F+LS-5 1m	145000558
Australia • 3PIN Longwell LP-23A+LFC-3R+LS-18 1m	145000557
Taiwan • 3PIN Longwell LP-71+VCTF+LS-33 1m	145000556
Japan • 3PIN Longwell LP-54+VCTF+LS-18 1m	145000555
Africa • 3PIN Longwell LP-39+H03VV-F+LS-18 1m	145000554
CE • 3PIN Longwell LP-34A+H03VV-F+LS-18 1m	145000553
CCC • 3PIN VOLEX GB10S3+RVV 300/500+VAC5S 1m	145000538
UL • 3PIN Volex US15S3+SPT-2 +VAC5S 1m	145000537
UK • 3PIN VOLEX MP5004+H03VV-F+VAC5S 1m	145000605
Indian • 3PIN VOLEX IA6A3+IS694+VAC5S 1m	145000536
Switzerland • 3PIN VOLEX MP232+H03VV-F+VAC5S 1m	145000524
Italy • 3PIN VOLEX IT10S3+HO3VV-F+VAC5S 1m	145000535
Denmark • 3PIN VOLEX MP233D+H03VV-F+VAC5S 1m	145000534
Korea • 3PIN VOLEX M2511+KETI IEC+VAC5S 1m	145000533
Australia • 3PIN VOLEX AU10S3+H03VV-F+VAC5S 1m	145000532
Taiwan • 3PIN VOLEX TW15CS3+VCTF+VAC5S 1m	145000531
Japan • 3PIN VOLEX VAC5S+VCTF+M755 1m	145000530

Table 9. Parts list—3-pin power cords (continued)

Region	P/N
Argentina • 3PIN VOLEX VA2073+H03VV-F+VAC5S 1m	145000528
Brazil • 3PIN VOLEX CH10S3+H03VV-F+VAC5S 1m	145000527
Israel • 3PIN VOLEX SI16S3+H03VV-F+VAC5S 1m	145000526
CE • 3PIN VOLEX M2511+HO3VV-F+VAC5S 1m	145000525

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